

1044b UIC - EAST POPLAR OIL FIELD
ENFORCEMENT CASE SDWA 1431
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Region 8



13661

HISTORY

C. H. MURPHY, JR., ET AL

EAST POPLAR UNIT #18

C SE/4 NW/4 Sec. 2, Twp., 28N, Rge. 51E
Roosevelt County, Montana

Elevation 2113 K.B.

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C. H. MURPHY, JR., ET ALEAST POPLAR UNIT #18

LOCATION: C SE/4 NW/4 Section 2, Township 28N, Range 51 East.

ELEVATION: 2113 R.K.B.

SPUDDED: November 11, 1952.

COMPLETED: December 20, 1952.

TOTAL DEPTH: 5809' Schlumberger = 5809' Driller.

HISTORY

November 11: Drilled 0 to 73' with 12 $\frac{1}{4}$ " bit.

November 12: Drilled 73' to 250', and stuck drill pipe.

November 13-14: Drilled 250' to 975' with 12 $\frac{1}{4}$ " bit.

November 15: Set 949.68' of 9 5/8" casing at 962.68' with 400 sacks of bulk cement and 7 sacks of calcium chloride. Plug down 3:45 P.M., 11-15-52.

November 16: Waiting on cement.

November 17: Waiting on cement. Drilled plug at 9:30 P.M. from 9 5/8" surface casing.

November 18-30: Drilled from 975' to 4896' with 8 3/4" rock bit. Began cutting Core No. 1 at 4896' with 7 7/8" diamond core bit.

December 1: Finished cutting and pulled Core No. 1, 4896 to 4923. Cut, with 7 7/8" diamond core bit, and pulled Core No. 2 from 4923-39'.

December 2: Reamed 4896 to 4939 with 8 3/4" rock bit and drilled to 5003'.

December 3: Drilled 5003 to 5140'.

December 4: Cut, with 7 7/8" diamond core bit, and pulled Core No. 3, 5140 to 5170'.

December 5: Cut, with 7 7/8" diamond core bit, and pulled Core No. 4, 5170 to 5189'. Ran Schlumberger ES; 5189 Driller = 5185 Schlumberger.

December 6: Reamed 5140 to 5189 with 8 3/4" bit and drilled to 5297'.

December 7-8: Drilled 5297 to 5531' with 8 3/4" rock bit.

- December 9: Cut, with 7 7/8" diamond core bit, Core No. 5, 5531 to 5556'. Drilled 5556 to 5571' with 7 7/8" rock bit.
- December 10: Drilled 5571 to 5646 with 7 7/8" rock bit. Began cutting Core No. 6 with 7 7/8" diamond core bit at 5646'.
- December 11: Finished cutting and pulled, Core No. 6 from 5646 to 5679'. Drilled from 5679 to 5740' with 7 7/8" rock bit.
- December 12: Drilled 5740 to 5774 and pulled out to cut Core No. 7 from 5774'. Began cutting Core No. 7 with 7 7/8" diamond Core bit.
- December 13: Finished cutting and pulled Core No. 7, 5774 to 5809'. Ran Schlumberger ES and Microlog.
- December 14: Set 5789' of 5 1/2" casing at 5800', with 250 sacks of cement.
- December 15-16: Waiting on cement.
- December 17: Well undergoing completion operations as outlined under "Completion Data".
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SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit C Battery and Wells EPU Nos. 5 & 18

The East Poplar Unit C Battery and the wells producing into the battery, EPU Nos. 5 and 18, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit C Lease is Murphy Oil Corporation located at P. O. Box 547, Poplar, Montana 59255. The corporate headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas, 71730.

The battery consists of a 6' x 27' vertical separator, a circulating pump with appropriate lines, and two 1,000 barrel galvanized bolted tanks. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks. An earthen pit of about 5,000 barrels capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.

Each of the wells are pumped. The EPU No. 5 has a rod pump and the EPU No. 18 has a Reda pump. There are 4' x 4' x 2' cellars at each wellhead with overflow lines to earthen pits capable of holding a full days fluid production in case of a leak at the well site.

The field flow lines and the well casing of each well are cathodically protected. The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The facilities are about 1.4 miles from Poplar River. The terrain dips gently West. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 5,000 barrel pit at the tank battery and the well cellars and overflow pits are sufficient secondary containment for these facilities.

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Each of the wells are pumped. The EPU No. 5 has a rod pump and the EPU No. 18 has a Reda pump. There are 4' x 4' x 2' cellars at each wellhead with overflow lines to earthen pits capable of holding a full days fluid production in case of a leak at the well site.

The field flow lines and the well casing of each well are cathodically protected. The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The facilities are about 1.8 miles from Poplar River. The terrain dips gently West. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 5,000 barrel pit at the tank battery and the well cellars

RECEIVED
FEB 17 1953

FORMATION RECORD

DEKOPS 2714

From	To	Feet	Formation
		5238	CLONCLOS
		5250	Morrison
		5370	Swift
		5392	Pierdon
		4260	Piper Shale
		4332	Piper Limestone
		4390	Gypsum Springs
		4586	Spearfish

		4700	Amsden
		4833	Heath
		5005	Outer
		5113	Kibbey Sand
		5301	Kibbey Limestone
		5397	Charles
		5513	A zone
		5650	B-1 Zone
		5667 1/2	B-2 Zone
		5800	Mission Canyone
		5808	C Zone Intercrystalline
			Porosity

DATE: DECEMBER 30 1952

HISTORY OF OIL OR GAS WELL

Spudded with dry hole digger to 36.80'. Set 13 3/8" conductor pipe 15' below R.B.
Cemented with 30 sacks cement and 8 yards re-mix. Total Depth: 46.80.
Spudded with rotary rig at 10:00 P.M., 11-11-52. Drilled to 250' and stuck drill pipe.
Managed to free drill pipe at approximately 4:00 P.M., 11-13-52.
Drilled to 975' with natural mud. Started out-of-hole-to-run-casing and gas started kicking. Conditioned mud; weighted up to 11.7#.

Ran 949.68' of 9 5/8" casing; set at 962.68'. Cemented with 400 sacks cement, 7 sacks Calcium Chloride. Plug down at 3:45 P.M., 11-15-52. Drilled plug and drilled to 3630.
Drilled from 3630 to 4896. Core # 1 Heath Sand from 4896 to 4923, Core # 2, 4923-4939.
Drilled from 4939 to 5140. Strapped pipe at 5140, no correction. Cored Kibbey Sand.
Core # 3 from 5140-5170. Cut and pulled Core # 4, 5170-5189. Drilled from 5189 to 5531.
Cut Core # 5, 5531-56. Drilled 5556-5646. Cut Core # 6, 5656-5679. Drilled 5679-5775. Cut and pulled Core # 7, 5774-5809. Ran Schlumberger from 5185 to 5809. 5809
Driller - Schlumberger.
Set 5789' of 5 1/2" casing at 5800 with 250 sacks. Plug down at 2:00 A.M. 12-15-52.

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SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

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AUTHORITY FOR EXPENDITUREMURPHY CORPORATION - EAST POPLAR UNIT #18Center of SE of NW of Sec. 2, Twp. 28 N, Rge. 51 E, Roosevelt Co., Montana

<u>WELL DRILLING & CONSTRUCTION EXPENSE:</u>	<u>TO CSG.PT.</u>	<u>COMP. & EQUIP.</u>	<u>TOTAL COST</u>
Drilling: Footage - 5800' @ \$8/ft.	\$ 46,400	\$	\$ 46,400
Day Work - 5 days @ \$925/day		4,625	4,625
Loc. survey, permit & prep.	200		200
Roads, fences, cattleguards, etc.	250		250
Mud mat. & chem., incl. oil	5,200		5,200
Fuel	5,500		5,500
Water	250		250
Drilling bits, baskets, etc.		200	200
Cementing casing	900	950	1,850
Coring materials & services	3,500		3,500
Testing services, incl. swabbing	1,800	300	2,100
Perforating services		650	650
Other logs, surveys, & analyses	1,400	650	2,050
Hydraftec, acidize, etc. incl. oil		750	750
Float equip., centralizers, etc.	125	250	375
Tubular inspection, testing, etc.		1,200	1,200
Trucking, welding & other labor	500	600	1,100
Supervision & Miscellaneous	1,800	1,200	3,000
Total Est. Well Drlg. & Const. Exp.	67,825	11,375	79,200
<u>WELL EQUIPMENT COSTS:</u>			
Casing: 1000' of 9-5/8" O.D. @ \$3.30/ft.	3,300		3,300
Casing: 6000' of 5-1/2" O.D. @ \$2.20/ft. (for pipe)		13,200	13,200
Tubing: 6000' of 2-3/8" O.D. @ \$0.55/ft.		3,300	3,300
Packers, etc.		650	650
Casing head & connections	300		300
Xmas tree & connections		1,200	1,200
Total Est. Well Equip. Costs	3,600	18,350	21,950
Total Est. Cost of Well	71,425	29,725	101,150
<u>LEASE EQUIPMENT:</u>			
Flow lines		800	800
Other line pipe, valves & fittings		750	750
Trucking, welding & other labor		800	800
Miscellaneous		700	700
Total Est. Cost of Lease Equip.	--	3,050	3,050
Total Est. Cost of Well & Lease Equip.	\$ 71,425	\$ 32,775	\$104,200

APPORTIONMENT OF TOTAL ESTIMATED COSTSAPPROVAL OF EXPENDITUREProduction DepartmentRequested by _____
Date _____Approved by _____ V.P.
Date _____Approved

By _____

Executive DepartmentApproved by _____
Date _____

Date _____

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2-T28N-R51E, Roosevelt County, Montana
(Installation of Pumping Unit)

Pumping Unit complete with engine	\$5,650
Labor and materials setting unit	750
Trucking, small fittings and incidentals	150
Rods, pump, and well head equipment	<u>3,000</u>
TOTAL ESTIMATED COST	\$9,550

APPORTIONMENT OF TOTAL ESTIMATED COST

	%	
Murphy Corporation -		
Unit Operator	31.448470	\$3,003
Munoco Company	2.096565	200
Placid Oil Company	33.548035	3,203
The Carter Oil Company	16.335860	1,560
Phillips Petroleum Company	16.335860	1,560
C. F. Lundgren	.238210	23

APPROVAL OF EXPENDITURE

Requested by:

Harold Miller JUN 11 1956
 Division Production Supt. Date

Recommend Approval:

J. D. Langford JUN 11 1956
 Division Manager Date

Approved:

 By Date

Recommend Approval:

 Staff Production Man Date

Recommend Approval:

 Budget Supervisor Date

Approved:

 Vice President-Operations Date

The present flowline on East Poplar Unit No. 18 is 2", regular, plain end line pipe. This line was in such a state of deterioration at the time of anode installation that it could not be saved. The installed anodes will be used on the new line. (Attempt will be made to delay installation until wheat harvest is over, but if too many leaks occur, will have to replace on short notice.)

Murphy Corporation	31.448470%	\$ 566
Munoco Company	2.096565%	38
Placid Oil Company	33.545035%	604
Garter Oil Company	16.335860%	294
Phillips Petroleum Company	16.335860%	294
C. F. Lundgren	.238210%	4

Requested by: MM 4 J 6-4-59 Recommend Approval:
Date

Division Production Supt. Date Staff Production Man Date

Recommend Approval:

R. L. Brady 6/8/59
Division Manager Date Budget Supervisor Date

Approved:

Vice President-Operations Date

Received approval from L. L. Barado
6-24-59

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E - Roosevelt County, Montana
(Replacement of Flowline)
(Supplement No. 1)

Additional cost of using 3" mill wrapped
 pipe and 3" connections instead of 2 3/8" EUE
 used tubing \$1,300

TOTAL ADDITIONAL COST \$1,300

Supplement #1 to A.F.E. No. 60-5001 is to cover the additional cost
 of using 3" mill wrapped line pipe and 3" connections instead of
 2 3/8" EUE Cond. 2 tubing.

APPORTIONMENT OF TOTAL ADDITIONAL COST

Murphy Corporation	31.448470%	\$ 409
Munoco Company	2.096565%	27
Placid Oil Company	33.545035%	436
Carter Oil Company	16.335860%	212
Phillips Petroleum Company	16.335860%	213
C. F. Lundgren	.238210%	3

APPROVAL OF EXPENDITURE

Requested by: *M. J. Jones* 3-17-60
 Field Production Supt. Date

Recommend Approval:

Recommend Approval:

Division Production Supt.

Date

Staff Production Man

Date

Recommend Approval:

Recommend Approval:

Division Manager

Date

Budget Supervisor

Date

APPROVED:

Approved Denver 3-24-60
No other approval necessary

Vice President - Operations

Date

File

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Change Tubing String)

PRESENT STATUS: Pumping from the E-1 & 2 Zones commingled, April 11, 1967 Well Test 493 BOPD 95% W.C. 25 BOPD 463 BOPD. Pumping depth 3935' 15 S.P.M. X 76" stroke X 2-1/4" bore pump. 2-7/8" Tubing 7/8" 42% and 3/4" 53% Sucker Rods.

TUBING RECORD

Date	Leak	Dia-Log	Type	Jts. Add	Ft.	M/R	Est Cost
1-5-66	2200'	No	R/C	1	31'		\$ 386.00
2-4-66		Yes	R/C	70	2170'	1	\$2,375.00
5-31-66	2200'	No	R/C	1	31'	4	\$ 455.00
4-30-67	1920'	No	R/C	1	31'	11	\$ 550.00
Totals	4			73	2263'	5 avg.	\$3,766.00

(Pay out including lost production 4.6 tubing jobs.)

ESTIMATED COST

Pulling Unit, 20 hrs. at \$33.00 per hr.	\$ 650.00
4050' of 2-7/8" EUE J-55 Tubing Class No. 1 at \$0.95 ft.	\$3,850.00
Tuboscope Salvaged Tubing at \$2.95 per ft.	\$ 375.00
Credit for Estimated 30% Class No. 2 1208' at \$0.71 per ft.	(\$ 850.00)
Credit for Estimated 30% Class No. 3 1208' at \$0.47 per ft.	(\$ 575.00)
Credit for Estimated 40% Class No. 4 1610' at \$0.15 per ft.	(\$ 250.00)
Misc. Labor, Trucking, and Rod Guides	\$ 500.00
Total Estimated Cost (Net)	\$3,700.00

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.443470%	\$1,164.00
Munoco Company	2.096565%	\$ 76.00
Placid Oil Company	33.545035%	\$1,241.00
Humble Oil and Refining Company	16.335860%	\$ 605.00
Drilling Specialties	16.335860%	\$ 605.00
C. F. Lundgren	.238210%	\$ 9.00

APPROVAL OF EXPENDITURE

Requested by:

APPROVED:

W. J. Thornton
 W. J. Thornton

5-5-67
 Date W. J. Thornton

5-5-67
 Date

L. L. Duncan
 L. L. Duncan

5/4/67
 Date

MTJ/sb
 May 2, 1967

Complete 11-21-67
 Raised Pump to 3000'

A.F.E. No. 1-1510-10

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SW NW Section 21, T29N, R51E, Roosevelt County, Montana
(Change Flow-Line)

PRESENT STATUS: Pumping from the A-4 Zone. Well Test 6-9-71 742 BFPD 95% Salt Water 259,050 PPM Salt.

We have had four (4) flow-line leaks within the last 9 month which damaged wheat and wheat land. (All flow-line leaks were external.)

The flow-line is to be relocated out of the wheat field and layed on top of the ground (should not freeze with 259,050 PPM salt). Parallel to the lease road in the bar ditch.

The flow-line is being layed now and A.F.E. No. 1-1510-10 is to confirm the estimated cost.

ESTIMATED COST

1643' of 2-3/8" EUE, 4.70#, Class No. 3 Tubing at \$0.44 per ft. (All Class No. 3 in EPU Stock)	\$ 725
1857' of 2-3/8" EUE, 4.70#, Class No. 2 Tubing at \$0.66 per ft. (EPU Stock)	\$ 1,225
Trucking, Stringing, and Lay On Top Of Ground	\$ 1,400
Misc. Labor, Trucking, and Connections	\$ 125
TOTAL ESTIMATED COST	\$ 3,475

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 1,093
Placid Oil Company	33.545035%	\$ 1,165
Humble Oil and Refining Company	16.335860%	\$ 568
Phillips Petroleum Company	16.335860%	\$ 568
Munoco Company	2.096565%	\$ 73
C. P. Lundgren	.238210%	\$ 8

APPROVAL OF EXPENDITURE

Requested by:

Approved By:

<u>M. F. James</u>	<u>6-18-71</u>	<u>Ira Johnson</u>	<u> </u>
M. F. James	Date	Ira Johnson	Date

<u>W. J. Thornton</u>	<u> </u>
W. J. Thornton	Date

WJL/ah
June 16, 1971

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
 (Install High Volume Pumping Equipment)

Supplement No. 1 is to cover additional expenses incurred while testing the Unidraulic pumping system. Originally the Unidraulic and Kobe equipment were to be leased for 90 days but the lease was extended for another 90 days. This plus the fact a building had to be constructed over the Unidraulic are 2 of the reasons the A.F.E. was overspent. The hook up of this equipment and pump-repairs were also greater than anticipated.

ESTIMATED COST

	Original A.F.E.	Supplement No. 1	Total Cost
Pulling Unit	\$ 600	\$ 69	\$ 669
Hydrotest	\$ 350	\$ 95	\$ 445
Bottom Hole Assembly & Packer Repair	\$ 1,825	\$ 1,183	\$ 3,008
Unidraulic Surface Equipment, Piping & Installation	\$ 9,525	\$ 5,144	\$14,669
Miscellaneous Labor, Material & Trucking	\$ 300	\$ 2,513	\$ 2,813
TOTAL COST	\$12,600	\$ 9,004	\$21,604

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,963	\$ 2,832	\$ 6,795
Placid Oil Company	33.545035%	\$ 4,227	\$ 3,020	\$ 7,247
Exxon Company, U.S.A.	16.335860%	\$ 2,058	\$ 1,471	\$ 3,529
Phillips Petroleum Company	16.335860%	\$ 2,058	\$ 1,471	\$ 3,529
Munoco Company	2.096565%	\$ 264	\$ 189	\$ 453
C. F. Lundgren	.238210%	\$ 30	\$ 21	\$ 51

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown
 W. G. Brown

6-27-73
 Date

A. W. Simpson
 A. W. Simpson

 Date

sb

June 27, 1973

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Install High Volume Pumping Equipment)

Proposal and Justification: It is proposed to install a high volume Unidraulic pumping system, on a 90 day lease purchase plan, to test the feasibility of pumping up to 2500 BFPD from the Madison B-Zone.

East Poplar Unit No. 18 is pumping from the B-1 & 2 Zones at the rate of 482 BFPD 14 BOPD 468 BWPD 97% BS&W (June, 1972 test). The 2-1/4" tubing pump is set at 3050' and the pumping fluid level is standing at 1400' indicating considerably more fluid is available. A high volume pumping system would allow us to withdraw up to 2500 BFPD and determine the effect on the surrounding wells and observe the water cut on East Poplar Unit No. 18. The other wells that may be affected are East Poplar Unit No. 5, No. 16, No. 85, which are all B-1 & 2 completions, and East Poplar Unit No. 17 which is a B-1 completion. Payout on this trial installation at 35 BOPD increase would be 280 days but would give valuable information on this type of system to be used at East Poplar Unit No. 18 or at other wells in the East Poplar Unit. The Unidraulic system would be able to regulate the production from 0 to 2500 BFPD at the most optimum rate.

ESTIMATED COST

Pulling Unit, 15 hrs.	\$ 600
Hydrotest	\$ 350
Bottom Hole Assembly & Packer Repair	\$ 1,825
Unidraulic Surface Equipment, Piping & Installation	\$ 9,525
Misc. Labor, Material and Trucking	\$ 300
TOTAL ESTIMATED COST	\$12,600

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,963
Placid Oil Company	33.545035%	\$ 4,227
Humble Oil and Refining Company	16.335860%	\$ 2,058
Phillips Petroleum Company	16.335860%	\$ 2,058
Munoco Company	2.096565%	\$ 264
C. F. Lundgren	.238210%	\$ 30

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

<u>W. G. Brown</u>	<u>7 25 1972</u>	<u>A. W. Simpson</u>	<u> </u>
W. G. Brown	Date	A. W. Simpson	Date

WGB/sb
 July 25, 1972

MURPHY OIL CORPORATION
 AUTHORITY FOR EXPENDITURE - EAST POPLAR UNIT NO. 18
 C SE NW SECTION 2-T28N-R51E, ROOSEVELT COUNTY, MONTANA

INSTALL HIGH VOLUME PUMPING EQUIPMENT

PROPOSAL & JUSTIFICATION

It is proposed to install a high volume Unidraulic pumping system, on a 90-day lease purchase plan, to test the feasibility of pumping up to 2500 BFPD from the Madison B Zone.

East Poplar Unit No. 18 is pumping from the B-1 and 2 Zones at the rate of 482 BFPD, 14 BOPD, 468 BWPB, 97% BS&W (June 1972 test). The 2-1/4" tubing pump is set at 3,050' and the pumping fluid level is standing at 1,400', indicating considerably more fluid is available. A high volume pumping system would allow us to withdraw up to 2,500 BFPD and determine the effect on the surrounding wells and observe the water cut on East Poplar Unit No. 18. The other wells that may be affected are East Poplar Unit Nos. 5, 16, and 85, which are all B-1 and 2 completions, and East Poplar Unit No. 17, which is a B-1 completion. Payout on this trial installation at 35 BOPD increase would be 280 days but would give valuable information on this type of system to be used at East Poplar Unit No. 18 or at other wells in the East Poplar Unit. The Unidraulic system would be able to regulate the production from zero to 2,500 BFPD at the most optimum rate.

ESTIMATED COST

Pulling Unit, 15 hrs.	\$ 600
Hydrotest	350
Bottom Hole Assembly & Packer Repair	1,825
Unidraulic Surface Equipment, Piping & Installation	9,525
Miscellaneous Labor, Material and Trucking	<u>300</u>
Total Estimated Cost	\$ 12,600

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,963
Placid Oil Company	33.545035%	4,227
Humble Oil & Refining Company	16.335860%	2,058
Phillips Petroleum Company	16.335860%	2,058
Munoco Company	2.096565%	264
C. F. Lundgren	.238210%	30

APPROVAL OF EXPENDITURE

Requested:

APPROVED:

W. G. Brown

7-25-72

Date

Date Job Completed 5-25-73

Approximate Cost \$21,604

By Gerald Hagadone

WGB/sb/cm

8-2-72

Date

The Unidraulic system did not work as planned but did indicate that more oil is available with a high volume withdrawal. These findings indicate that a Red pump may be feasible and will be tried. Refer to A.F.E. 3-1521-.0 WGB

MURPHY OIL CORPORATION
AUTHORITY FOR EXPENDITURE - EAST POPLAR UNIT NO. 18
C SE NW, SECTION 2-T28N-R51E, ROOSEVELT COUNTY, MONTANA

INSTALL REDA PUMPING EQUIPMENT

PROPOSAL & JUSTIFICATION

It is proposed to install a Reda Pump in East Poplar Unit No. 18 in order to further test the feasibility of high volume lifting from the Madison "B" Zone.

It is recommended that a Reda Pump be used in order to further test production performance of high withdrawal rates in light of the mechanical failure of a hydraulic system which was used on a rental-purchase basis and was recently removed. Desired high volumes could not be reached on a sustained basis by use of the Unidraulic-Kobe System. Kobe has advised that a special pump can not be economically made at this time due to high stresses coupled with corrosion as encountered in this particular application. Even though continuous operation of the Unidraulic-Kobe System could not be attained, we did get indications that the well would produce approximately 60 BOPD with 1,150 BWPD with a water cut of 95%. The oil percentage of total fluid increased from 3% to 5% (97% water versus 95% water) by increasing the total fluid handled by beam pump from 500 BPD to 1,200 BPD with the hydraulic system.

It is now recommended that a Reda Pump be installed in East Poplar Unit No. 18 on a 60-day trial basis in order to further evaluate high volume lifting as to this well and its possible use in other Unit wells. Reda Pump Company of Bartlesville, Oklahoma, was approached and furnished the estimated costs for a Reda installation on a 60-day trial basis.

ESTIMATED COST

Pulling Unit	\$ 800
Reda Pump Rental	2,247
Transportation to and from Bartlesville	300
Miscellaneous Labor, Material and Transportation	4,750
	<u>5,275.26</u>
TOTAL ESTIMATED COST (for a 60-day trial)	\$ 8,097

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 2,546
Placid Oil Company	33.545035%	2,716
Exxon Company, U.S.A.	16.335860%	1,323
Phillips Petroleum Company	16.335860%	1,323
Munoco Company	2.096565%	170
C. F. Lundgren	.238210%	19

APPROVAL OF EXPENDITURE

Requested:

APPROVED:

W. G. BROWN

6-11-73

Date

Date

RGC/cm
6-11-73

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Install High Volume Pumping Equipment)

Supplement No. 1 is to cover additional expenses incurred while testing the Unidraulic pumping system. Originally the Unidraulic and Kobe equipment were to be leased for 90 days but the lease was extended for another 90 days. This plus the fact a building had to be constructed over the Unidraulic are 2 of the reasons the A.F.E. was overspent. The hook up of this equipment and pump repairs were also greater than anticipated.

ESTIMATED COST

	Original A.F.E.	Supplement No. 1	Total Cost
Pulling Unit	\$ 600	\$ 69	\$ 669
Hydrotest	350	95	445
Bottom Hole Assembly & Packer Repair	1,825	1,183	3,008
Unidraulic Surface Equipment, Piping & Installation	9,525	5,144	14,669
Miscellaneous Labor, Material & Trucking	300	2,513	2,813
TOTAL COST	\$12,600	\$ 9,004	\$21,604

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,963	\$ 2,832	\$ 6,795
Placid Oil Company	33.545035%	4,227	3,020	7,247
Exxon Company, U.S.A.	16.335860%	2,058	1,471	3,529
Phillips Petroleum Company	16.335860%	2,058	1,471	3,529
Munoco Company	2.096565%	264	189	453
C. F. Lundgren	.238210%	30	21	51

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

<u>W. G. Brown</u>	6-27-73	<u>A. W. Simpson</u>	7/12/73
W. G. Brown	Date	A. W. Simpson	Date

sb

June 27, 1973

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Purchase Reda Pump)

PROPOSAL and JUSTIFICATION: It is proposed to purchase the Reda pump that has been on a 60 day trial period at East Poplar Unit No. 18.

East Poplar Unit No. 18 was originally chosen as the test well for high volume lift equipment in May of 1972. This well was pumping from the B-1 & 2 Zones with an 1400' fluid level at the rate of 482 BFPD 14 BOPD 468 BWPD 97% BS&W. A National Unidraulic and Kobe type "E" pump was tried for a 6 month period but proved to be uneconomical to operate. It did prove however that a high fluid withdrawal system would lower the water cut and produce more oil when more formation fluid was moved. A conventional tubing pump was ran after the Unidraulic trial and tested at the rate of 495 BFPD 10 BOPD 485 BWPD 98% BS&W. A Reda pump was approved for a 60 day trial period, on A.F.E. # 3-1521-10, which will expire on October 2, 1973. The latest water draw test with the Reda pump shows 1,327 BFPD 54 BOPD 1,273 BWPD 96% BS&W. This test seems to be very accurate as tank battery production is remaining very constant. Production of 54 BOPD gives an increase of 44 BOPD over what the tubing pump showed prior to the Reda installation. Payout for this unit using 44 BOPD at \$4.00 per bbl. would be 219 days. Assuming the total 54 BOPD was used for payout this would bring it down to 179 days.

ESTIMATED COST

Reda Pump as per Quote C-7328	\$40,835.60
Less 60 Day Rental Already Paid	(\$ 2,247.00)
TOTAL ESTIMATED COST	\$38,588.60

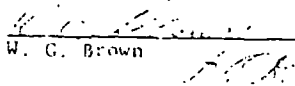
APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$12,135.52
Placid Oil Company	33.545035%	\$12,944.56
Exxon Company, U.S.A.	16.335860%	\$ 6,303.78
Phillips Petroleum Company	16.335860%	\$ 6,303.78
Monoco Company	2.096565%	\$ 809.04
C. F. Lundgren	.278210%	\$ 91.92

APPROVAL OF EXPENDITURE

Requested by:

Approved by:


W. G. Brown


Date

A. W. Simpson

Date

MURPHY OIL CORPORATION
 AUTHORITY FOR EXPENDITURE - EAST POPLAR UNIT NO. 18
 C SE NW SECTION 2-T28N-R51E, ROOSEVELT COUNTY, MONTANA

PURCHASE REDA PUMP

PROPOSAL & JUSTIFICATION

It is proposed to purchase a Reda Pump Assembly which has been on a 60-day trial period at East Poplar Unit No. 18.

East Poplar Unit No. 18 was originally chosen as the test well for high-volume lift equipment in May, 1972. Prior to May, 1972, this well was pumping from the Madison "B-1" and "B-2" Zones with a 1400' fluid level at the rate of 482 BFPD, 10 BOPD, 468 BWP, 98% BS&W. A National Unidraulic and Kobe Type "E" Pump Assembly was tried for a 6-month period but proved to be uneconomical to operate due to mechanical problems. It did prove, however, that a high fluid withdrawal system would lower the water cut and produce more oil when more formation fluid was moved. A conventional tubing pump was run after the Unidraulic trial and tested at the rate of 495 BFPD, 10 BOPD, 485 BWP, 98% BS&W. A Reda pump was approved for a 60-day trial period by A.F.E. No. 3-1521-10. This 60-day trial period will expire on October 2, 1973. The latest well test with the Reda pump shows a rate of 1,327 BFPD, 54 BOPD, 1,273 BWP, 96% BS&W. This test seems to be very accurate as tank battery production is remaining very constant. A production rate of 54 BOPD gives an increase of 44 BOPD over what the tubing pump showed prior to the Reda installation. Payout for this Unit, based on an average increased rate during payout of 40 BOPD and after deducting for increased operating costs, is expected to occur in 9 months.

It is difficult to assess, based on the limited testing done to date with high-volume lift equipment, just what gain can be made in improving ultimate recovery. No reductions have been noted in oil rates from nearby wells due to the increased withdrawal from E.P.U. No. 18. The information at this time is encouraging to the extent that we think the high-volume lifting technique with Reda equipment should be tried over an extended period of time and that we should outright purchase the test assembly.

ESTIMATED COST

Reda Pump	\$ 40,835
Less 60-Day Rental Already Paid	(2,247)
TOTAL ESTIMATED COST	\$ 38,588

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 12,135
Placid Oil Company	33.545035%	12,944
Exxon Company, U.S.A.	16.335860%	6,304
Phillips Petroleum Company	16.335860%	6,304
Munoco Company	2.096565%	809
C. F. Lundgren	.238210%	92

APPROVAL OF EXPENDITURE

Requested:

APPROVED:

W. G. BROWN

9-25-73

Date

WGB/sb/cm

9-26-73

Date Job Completed 10-2-73

Approximate Cost \$38,588

By W. G. Brown

The justification explains the outcome of this installation. The initial running of the pump went fine and is still operating fine as of this date 10-10-73 WGB.

Charles D. Simpson

9/26/73
Date

Carl E. Haskins

9/26/73
Date

Charles D. Simpson

9/26/73
Date

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
C SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Supplement No. 1)

The motor and pump did not have to be dried out and cleaned up. This accounts for the underage on this A.F.E.. (A.F.E. No. 3-1531-10 has been submitted to purchase Reda pump.)

ESTIMATED COST

	Original A.F.E.	Revised Cost	Supplement
Pulling Unit	\$ 800	\$ 926	\$ 126
Reda Pump Rental	2,247	2,247	--
Transporation	300	946	646
Misc. Labor, Etc.	4,750	1,156	(3,594)
TOTAL	\$ 8,097	\$ 5,275	\$(2,822)

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 2,546	\$ 1,659	\$ (887)
Placid Oil Company	33.545035%	2,716	1,769	(947)
Exxon Company, U.S.A.	16.335860%	1,323	862	(461)
Phillips Petroluem Company	16.335860%	1,323	862	(461)
Munoco Company	2.096565%	170	111	(59)
C. F. Lundgren	.238210%	19	12	(7)

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown
W. G. Brown

4-27-73
Date

A. W. Simpson 10/1/73
A. W. Simpson Date

WGB/sb
September 27, 1973

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
 (Confirming A.F.E. - Change Out Reda Pump)

JUSTIFICATION: The Reda pump went down 2/4/74. The pump had plugged up with gyp and the shaft had twisted off. At this time it was decided to run a smaller Reda into this well as less fluid was available than had originally been anticipated. It is hoped that by running a smaller pump the shaft will not twist off again. The well is also being treated with chemical to prevent gyp build up.

ESTIMATED COST

Pump Repair and Exchange	\$ 3,282
Serviceman	\$ 2,047
Pulling Unit	\$ 2,199
Trucking	\$ 485
Extra Labor To Assist In Pulling And Running Reda Pump	\$ 236
Misc. Material, Trucking and Supervision	\$ 228
TOTAL ESTIMATED COST	\$ 8,477

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 2,666
Placid Oil Company	33.545035%	\$ 2,844
Exxon Company, U.S.A.	16.335860%	\$ 1,385
Phillips Petroleum Company	16.335860%	\$ 1,385
Munoco Company	2.096565%	\$ 177
C. F. Lundgren	.238210%	\$ 20

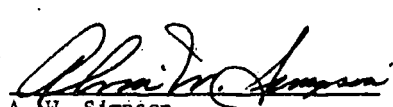
APPROVAL OF EXPENDITURE

Requested By:

Approved By:


 W. G. Brown

 5-3-74
 Date


 A. W. Simpson

 5/13/74
 Date

Date Job Completed 2-15-74
 Approximate Cost \$8,477
 By Gerald Hagadone

The new pump was ran on 2-15-74 and has been operating fine since that time.
 The job went as planned. WGB 6-25-74

sb
 May 2, 1974

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Confirming Reda Pump Repair)

JUSTIFICATION: East Poplar Unit No. 18 went down sometime during the early morning of July 7th. An electrical storm passed thru the East Poplar Unit and it was determined later that lightning had struck the well. It caused the motor to burn out and also blew the cable in to. The Reda pump had to be pulled and replaced with another pump. The cable also had to be repaired. This A.F.E. covers the expense of doing this work.

ESTIMATED COST

Pulling Unit	\$ 958
Reda Pump Repair	\$ 8,779
Serviceman Expense	\$ 1,699
Roustabout Labor to assist in pulling and running Reda Pump	\$ 423
Misc. Material, Supervision and Trucking	\$ 553
TOTAL ESTIMATED COST	\$12,412

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,903
Placid Oil Company	33.545035%	\$ 4,163
Phillips Petroleum Company	16.335860%	\$ 2,028
Exxon Company, U.S.A.	16.335860%	\$ 2,028
Munoco Company	2.096565%	\$ 260
C. F. Lundgren	.238210%	\$ 30

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown
W. G. Brown

9-27-74
Date

A. W. Simpson
A. W. Simpson

Date

A.F.E. No. 4-1524-10

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T24N, R51E, Roosevelt County, Montana
 (Confirming Reda Pump Repair)

JUSTIFICATION: East Poplar Unit No. 18 went down sometime during the early morning of July 7th. An electrical storm passed thru the East Poplar Unit and it was determined later that lightning had struck the well. It caused the motor to burn out and also blew the cable in too. The Reda pump had to be pulled and replaced with another pump. The cable also had to be repaired. This A.F.E. covers the expense of doing this work.

ESTIMATED COST

Pulling Unit	\$ 958
Reda Pump Repair	\$ 8,779
Serviceman Expense	\$ 1,699
Roustabout Labor to assist in pulling and running Reda Pump	\$ 423
Misc. Material, Supervision and Trucking	\$ 553
TOTAL ESTIMATED COST	\$12,412

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,903
Placid Oil Company	33.545035%	\$ 4,163
Phillips Petroleum Company	16.335860%	\$ 2,028
Exxon Company, U.S.A.	16.335860%	\$ 2,028
Munoco Company	2.096565%	\$ 260
C. F. Lundgren	.238210%	\$ 30


APPROVAL OF EXPENDITURE

Requested by:

Approved by:


 W. G. Brown

Date


 A. W. Simpson

Date

9/30/74

Date Job Completed: July 18, 1974

Approximate Cost: \$ 12,412

By: Gerald Hagadone

sb

September 27, 1974

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
 (Confirming A.F.E. - Repair Electrical Cable and Replace Reda Pump)

The cable had shorted out causing the pump to go down. Repairs were made to the cable at 25', 5155', and 5355'. The flat cable was also replaced. It was decided to change the 140 H.P. motor and pump, which were ran in July, 1974, with 160 H.P. motor and pump.

ESTIMATED COST

Pulling Unit	\$ 1,200
Reda Serviceman	\$ 1,699
Reda Pump Repair	\$ 9,426
Roustabout Labor to assist in pulling and running pump	\$ 329
Misc. Material, Labor and Supervision	\$ 531
TOTAL ESTIMATED COST	\$13,185

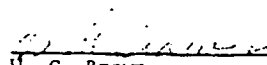
APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 4,147
Placid Oil Company	33.545035%	\$ 4,423
Exxon Company, U.S.A.	16.335860%	\$ 2,154
Phillips Petroleum Company	16.335860%	\$ 2,154
Munoco Company	2.096565%	\$ 276
C. F. Lundgren	.238210%	\$ 31

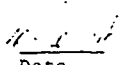
APPROVAL OF EXPENDITURE

Requested by:

Approved by:


 W. G. Brown

Date


 A. W. Simpson

Date

sb

October 30, 1974

MURPHY OIL CORPORATION
 AUTHORITY FOR EXPENDITURE - EAST POPLAR UNIT NO. 18
 SE NW SECTION 2, T28N, R51E, ROOSEVELT COUNTY, MONTANA
REPAIR ELECTRICAL CABLE AND REPLACE REDA PUMP

PROPOSAL & JUSTIFICATION

East Poplar Unit No. 18 Reda Pump cable shorted out and the Reda Pump had to be pulled for repairs. Upon pulling the pump the cable was found to be shorted out at 25', 5155', and 5355'. The flat cable had to be replaced in its entirety as the temperature was breaking down the lead sheath protection. At this time it was decided to replace the 140 H.P. motor and pump with a 160 H.P. motor and pump and restore the well to production.

ESTIMATED COSTS

Pulling Unit-----	\$ 1,200
Reda Serviceman-----	1,699
Reda Pump Repair-----	9,426
Roustabout Labor-----	329
Misc. Material, Labor and Supervision-----	531
 TOTAL ESTIMATED COSTS-----	 \$ 13,185

APPORTIONMENT OF TOTAL ESTIMATED COSTS

Murphy Oil Corporation	31.448470%	\$ 4,147
Placid Oil Company	33.545035%	4,423
Exxon Company, U.S.A.	16.335860%	2,154
Phillips Petroleum Company	16.335860%	2,154
Munoco Company	2.096565%	276
C. F. Lundgren	.238210%	31

APPROVAL OF EXPENDITURE

Requested By:

APPROVED BY:

W. G. BROWN

 11-10-74
 Date



 11/27/74
 Date

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Confirming Reda Pump Repair)

Confirming the cost to repair Reda pump after the motor burned out.

ESTIMATED COST

Pulling Unit	\$ 1,989
Pump Repair	8,580
Serviceman	1,240
Roustabout Cost to assist in pulling & running pump	693
Misc. Material, Labor and Trucking	735
 Total Estimated Cost	 \$13,237

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 4,163
Placid Oil Company	33.545035%	\$ 4,440
Exxon Company, U.S.A.	16.335860%	\$ 2,162
Phillips Petroleum Company	16.335860%	\$ 2,162
Munoco Company	2.096565%	\$ 278
C.F. Lundgren	.238210%	\$ 32

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown 1-29-74 A. W. Simpson 2/4/74
 W. G. Brown Date A. W. Simpson Date

sb
 January 29, 1974

Date Job Completed 12/8/73
 Approp. amount Cost \$ 13,237
 By - W. G. Brown

AUTHORITY FOR EXPENDITUREMURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18SE NW Section 2, T28N, R51E, Roosevelt County, Montana

(Confirming A.F.E. - Fish Parted Tubing - Replace Cable, Pump & Motor)

JUSTIFICATION: A new pump and motor was just ran in this well and after pumping for 1-1/2 hours the pump went down. The tubing was pulled and found that a collar was split 48 stands below the surface, which parted the cable. An Acme spear was used to fish the tubing and cable. A new motor, pump and no. 4 cable was ran and the well put back on pump.

ESTIMATED COST

Pulling Unit	\$ 1,608
Pump and Motor Repairs	\$ 8,640
Cable	\$16,040
Reda Serviceman	\$ 1,736
Roustabout Labor To Assist In Pulling and Running Reda	\$ 437
Misc. Material and Labor	\$ 326
Transportation	\$ 1,243
TOTAL ESTIMATED COST	\$30,030

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 9,444
Placid Oil Company	33.545035%	\$10,074
Exxon Company, U.S.A.	16.335860%	\$ 4,905
Phillips Petroleum Company	16.335860%	\$ 4,905
Munoco Company	2.096565%	\$ 630
C. F. Lundgren	.238210%	\$ 72

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown
W. G. Brown

Date

A. W. Simpson
A. W. Simpson

Date

Carl E. Haskett 4/2/75
Date

Date Completed - 10-1-75
Approximate Cost - \$30,030 -
By RB Reppe

Filed for Partner Approval
6-10-75
CH

A.P.E. No. 5-1505-10

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Replace Submersible Pump)

PROPOSAL & JUSTIFICATION: It is proposed to change the pump and motor in this well.

A down hole short has occurred in either the pump motor or the cable and has to be repaired to get the well back on production. The pump and motor design is to be changed slightly in an effort to prevent further down hole problems. The new pump motor will be 140 H.P. and the pump will be a straight design D-40 rather than a tapered pump.

ESTIMATED COST

Pulling Unit, 25 Hrs.	1371	(504)	\$ 1,875
Reda Pump Exchange, Trucking and Service	15,209	2,209	\$ 13,000
Misc. Labor, Material and Trucking	466	(534)	\$ 1,000
TOTAL ESTIMATED COST	17,046		\$ 15,875

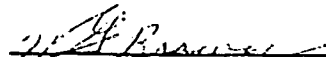
APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 4,993
Placid Oil Company	33.545035%	\$ 5,325
Exxon Company, U.S.A.	16.335860%	\$ 2,593
Phillips Petroleum Company	16.335860%	\$ 2,593
Munoco Company	2.096565%	\$ 333
C. F. Lundgren	.230210%	\$ 38


APPROVAL OF EXPENDITURE

Requested by:

Approved by:


W. G. Brown

Date


A. W. Simpson

Date

This work was completed before Bill Brown left, and the pump has not given trouble - however, we did have a short in the cable at 3968' with estimated repair cost of about \$1,900 (7-18-75) BM

Date Job Completed 6-25-75
Estimated Cost \$17,046
By=Gerald Hagadone

WGB/sb
June 3, 1975

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
 (Confirming A.F.E. - Motor Burned Out, Pumps Worn)

JUSTIFICATION: A new pump and motor was run in this well. The motor that was in this well burned out. The pump was worn bad enough to require replacement.

ESTIMATED COST

Pulling Unit	\$ 1,470
Reda Pump and Motor Exchange, Trucking, and Service	\$ 14,543
Misc. Labor, Supervision and Trucking	\$ 400
 TOTAL ESTIMATED COST	 \$ 16,413

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 5,161
Placid Oil Company	33.545035%	\$ 5,506
Exxon Company, U.S.A.	16.335860%	\$ 2,681
Phillips Petroleum Company	16.335860%	\$ 2,681
Munoco Company	2.096565%	\$ 345
C. P. Lundgren	.238210%	\$ 39

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Billy G. Melear
 Billy G. Melear

11/19/75
 Date

A. W. Simpson
 A. W. Simpson

11/24/75
 Date

11/12/75

\$ 14,064

A.F.E. No. 6-1505-10

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana

The Reda pump and motor was changed out in November of 1975 after having a run of 5 months. The Reda service man has found the motor's shorted, but the pumps turn free and appear to be in good condition. Test before pump failed indicate pumping 51 BOD and 1661 BWD with a 97% water cut. Reda will try to determine cause of failure in shop.

Recommend changing out motor and rerunning pump.

ESTIMATED COST

Pulling Unit	\$ 2,700
Replacement Reda Motors (2 80 H.P.)	\$ 7,040
Bands	\$ 256
Splicing Kit, Installation Kit, Guards	\$ 82
Bleeder and Check Valves	\$ 11
Flat Cable	\$ 505
Serviceman	\$ 675
Roustabout Labor to assist in pulling and running Reda	\$ 375
TOTAL ESTIMATED COST	\$11,644

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,662
Placid Oil Company	33.545035%	\$ 3,906
Exxon Company, U.S.A.	16.335860%	\$ 1,902
Phillips Petroleum Company	16.335860%	\$ 1,902
Munoco Company	2.09696%	\$ 244
C. F. Lundgren	.238210%	\$ 28

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Billy G. Melear
 Billy G. Melear

A. W. Simpson
 Date A. W. Simpson

3/8/76
 Date

Closed out at 16,146

BGM/sb

March 4, 1976

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
(Replace Submersible Pump - Supplement No. 1)

Supplement No. 1 for A.F.E. No. 6-1505-10. We overspent on this well by \$4,502. Most of this was for Reda motor exchange and Reda serviceman.

ESTIMATED COST

	Original A.F.E.	Actual Cost	Supplement No. 1
Pulling Unit	\$ 2,700	\$ 2,990	\$ 290
Reda Motors	\$ 7,040	\$ 8,819	\$ 1,779
Serviceman, Bands, Splicing Kits, Flat Cable, Etc.	\$ 1,529	\$ 3,417	\$ 1,888
Roustabout Labor	\$ 375	\$ 670	\$ 295
Misc.	\$-----	\$ 250	\$ 250
TOTAL ESTIMATED COST	\$11,644	\$16,146	\$ 4,502

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 3,662	\$ 5,078	\$ 1,416
Placid Oil Company	33.545035%	\$ 3,906	\$ 5,416	\$ 1,510
Exxon Company, U.S.A.	16.335860%	\$ 1,902	\$ 2,638	\$ 736
Phillips Petroleum Company	16.335860%	\$ 1,902	\$ 2,638	\$ 736
Munoco Company	2.096565%	\$ 244	\$ 338	\$ 94
C. F. Lundgren	.238210%	\$ 28	\$ 38	\$ 10

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Billy G. Mclear
 Billy G. Mclear

Date

A. W. Simpson

Date

AUTHORITY FOR EXPENDITURE

MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 18
SE NW Section 2, T28N, R51E, Roosevelt County, Montana
 (Confirming A.F.E. - Motors Burned, Pumps Worn)

The Reda equipment in this well was run in March, 1976 and pulled in August, 1976 giving a 5 month run. The motors were burned and the pumps were worn. In addition the electric cable used in this installation needs to be replaced. The current well test is 47 BOPD and 1523 BWP/D with a 97% water cut.

ESTIMATED COST

Pulling Unit	\$ 2,300
Replacement Motors, Pumps, Protector and Flat Cable Extension	\$13,000
5700' No. 2 Redalead Cable	\$14,500
Reda Serviceman	\$ 500
Rousatbout Labor	\$ 500
Supervision, Trucking, Misc.	\$ 500
TOTAL ESTIMATED COST	\$31,300

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 9,843
Placid Oil Company	33.545035%	\$10,500
Exxon Company, U.S.A.	16.335860%	\$ 5,113
Phillips Petroleum Company	16.335860%	\$ 5,113
Munoco Company	2.096565%	\$ 656
C. F. Lundgren	.238210%	\$ 75

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Billy G. Melear
 Billy G. Melear (BGM)

8/19/76
 Date

A. W. Simpson
 A. W. Simpson

8/25/76
 Date

MURPHY OIL USA, INC.
AUTHORITY FOR EXPENDITURE
EAST POPLAR UNIT NO. 18
C SE NW SECTION 2, T28N, R51E
ROOSEVELT COUNTY, MONTANA

PROPOSAL & JUSTIFICATION:

East Poplar Unit No. 18 is temporarily abandon, the last test showed 3 BOPD, 535 BWPD 99% water. It is proposed to set a CIBP at 5600', perforate the A-4 Zone @ 5525'-33', swab test and if necessary, acidize with 250 gallons mud acid. With 20 barrels per day increase in production pay out should be in 90 days.

ESTIMATED COST

Workover Rig -----	\$ 7,000
Perforate & CIBP -----	3,500
Acid -----	2,000
Water Truck -----	500
Packer -----	1,500
Supervision & Miscellaneous -----	1,500
TOTAL ESTIMATED COST	\$16,000

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil USA, Inc.	60.363718%	\$ 9,658
Exxon Company U.S.A.	16.335860%	2,614
Doil Oil & Gas Corp	20.965647%	3,355
Munoco	2.096565%	335
C.F. Lundgren	.238210%	38

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Raymond P. Reede 10-24-89 Date A. W. Simpson 10/31/89 Date

RR/jh
October 24, 1989

DATE JOB COMPLETED_____
APPROXIMATE COST_____
BY_____

A.F.E. NO. 0-0517-010

MURPHY OIL USA, INC.
 AUTHORITY FOR EXPENDITURE
 EAST POPLAR UNIT NO 18
 C SE NW SECTION 2, T28N, R51E
 ROOSEVELT COUNTY, MONTANA

PROPOSAL & JUSTIFICATION:

EPU No. 18 is producing from the A-4 Zone @ 11 BOPD and 780 BWPD pumping from 3000' with a 228-180-72 Lufkin pumping unit. It is proposed to move the American 456-253-144 unit from Trimble No. 1 to EPU No. 18. This well should pump 26 BOPD and 1274 BWPD, at this rate it should pay out in 180 days.

ESTIMATED COST

Condition #2 American 456-253-144 pumping unit ----	\$ 25,000
Trucking -----	3,000
Roustabout -----	2,000
Welder -----	500
Porta Pad -----	2,700
Supervision & Miscellaneous -----	2,800
Credit 228 Lufkin pumping unit -----	(10,000)
TOTAL ESTIMATED COST	\$ 26,000

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil USA, Inc.	60.363718%	\$ 15,695
Doil Oil & Gas Corporation	20.965647%	5,451
Exxon Company U.S.A.	16.335869%	4,247
Munoco Company	2.096565%	545
C.F. Lundgren	.238210%	62

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

Raymond Reede 10-12-90
 Raymond Reede Date

Sidney W. Campbell 10/30/90
 Sidney Campbell Date

Ch. F. Lundgren 11/5/90
 Ch. F. Lundgren Date

RR/jh
 October 12, 1990

DATE JOB COMPLETED.....
APPROXIMATE COST.....
BY.....

PERMIT
APPLICATIONS

0--5
or 1983)
ly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on re-
verse side)

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

1. LEASE DESIGNATION AND SERIAL NO.

Fee (Zimmerman)

2. IF INDIAN, ALLOTTEE OR TRIBE NAME

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT--" for such proposals.)

7. UNIT AGREEMENT MADE

East Poplar Unit

8. FARM OR LEASE NAME

East Poplar Unit

9. WELL NO.

18

10. FIELD AND POOL, OR WILDCAT

East Poplar Unit

11. SEC., T., R., M., OR BLK. AND
SUBVY OR AREA

SE NW Section 2,
T28N, R51E

12. COUNTY OR PARISH 13. STATE

Roosevelt MT

OIL WELL ☒ GAS WELL ☐ OTHER ☐

2. NAME OF OPERATOR

Murphy Oil USA, Inc.

3. ADDRESS OF OPERATOR

P.O. Box 547, Poplar, MT 59255

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)
At surface

14. PERMIT NO.

15. ELEVATIONS (Show whether DP, RT, GR, etc.)

2113' RKB

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETION

ABANDON*

CHANGE PLANS

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

(Other)

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any
proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones perti-
nent to this work.) *

East Poplar Unit No. 18 is temporarily abandoned. It is proposed to
set a CIBP at 5600', perforate the A-4 Zone @ 5525'-33', swab test
and if necessary, acidize with 250 gallons mud acid.

18. I hereby certify that the foregoing is true and correct

SIGNED

Ray Keedle

TITLE District Manager

DATE 12-22-89

(This space for Federal or State office use)

APPROVED BY

John [Signature]

TITLE

ADM-Minerals

DATE DEC 28 1989

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the
United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

JP

(SUBMIT IN QUADRUPPLICATE)

TO

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE BOARD.

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

SUNDRY NOTICES AND REPORT OF WELLS

ARM 36.22.307 ARM 36.22.1003
ARM 36.22.601 ARM 36.22.1004
ARM 36.22.602 ARM 36.22.1013
ARM 36.22.603 ARM 36.22.1301
ARM 36.22.604 ARM 36.22.1306
ARM 36.22.605 ARM 36.22.1309

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement	X	Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

December 29, 1989

Following is a ~~notice of intention to do work~~ on land ~~XXXXXX~~ described as follows:
~~XXXXXX~~ leased

LEASE TYPE Private
(Private, State, Federal, Indian)

LEASE East Poplar Unit 18

MONTANA Roosevelt East Poplar Unit
(State) (County) (Field)

Well No. 18 SE NW Section 2 T28N R51E MPM
(m. sec.) (Township) (Range) (Meridian)

The well is located 1980 ft. from N 8X line and 1980 ft. from W W line of Sec. 2

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists _____

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2113'

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

East Poplar Unit No. 18 is temporarily abandoned. It is proposed to set a CIBP at 5600', perforate the A-4 Zone @ 5525'-33', swab test and if necessary, acidize with 250 gallons mud acid.

Approved subject to conditions on reverse of form

Date JAN 04 1990

By P. Lloyd W. Roberts, full sup.
District Office Agent Title

Company Murphy Oil USA, Inc.By Raymond ReedTitle District ManagerAddress Box 547, Poplar, MT 59255

BOARD USE ONLY
API WELL NUMBER

STATE COUNTY WELL
218 21815 218156

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

(SUBMIT IN QUADRUPLICATE)

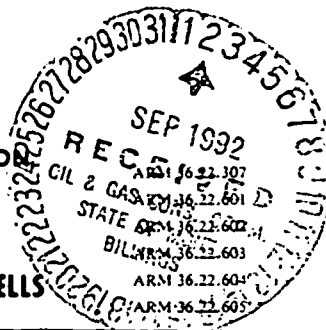
TO

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE BOARD.

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBURY

SUNDRY NOTICES AND REPORT OF WELLS



ARM 36.22.1003
ARM 36.22.1004
ARM 36.22.1013
ARM 36.22.1301
ARM 36.22.1306
ARM 36.22.1309

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	X
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 31, 1992

Following is a ~~notice of intention to do work~~ report of work done on land ~~owned~~ leased described as follows:

LEASE TYPE Private
(Private, State, Federal, Indian)

LEASE East Poplar Unit 18

MONTANA
(State)

Roosevelt
(County)

East Poplar Unit
(Field)

Well No. 18 SE NW Section 2 T28N R51E MPM
(m. sec.) (Township) (Range) (Meridian)

The well is located 1980 ft. from ~~N~~X line and 1980 ft. from ~~W~~W line of Sec. 2

* For notice of intention to drill, write the API* or the well name of another well on this lease if one exists

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2113'

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

A CIBP was set at 5600'. The A-4 Zone was perforated at 5525'-5533' and pump tested. Current test is 7 BOPD and 649 BWP.

Approved subject to conditions on reverse of form

Date 9/3/92

By James W. Halverson Geologist
District Office Agent Title

Company Murphy Oil USA, Inc.

By Raymond Reede

Title District Manager

Address Box 547, Poplar, MT 59255

BOARD USE ONLY
API WELL NUMBER

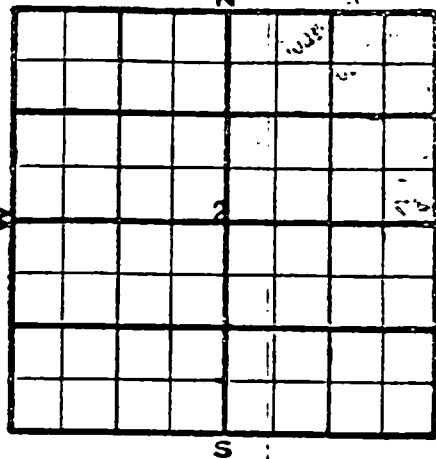
STATE COUNTY WELL
0815 01501516

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL

LOCATE WELL CORRECTLY

This Log to Be Rendered in Four Copies

BEST COPY'S
Form AVAILABLE



API # 25-085-05056

Lease East Poplar Unit.

BOARD OF RAILROAD COMMISSIONERS OF THE STATE OF MONTANA

Paul T. Smith, Chairman

Austin B. Middleton, Commissioner

Leonard C. Young, Commissioner

OIL AND GAS WELL DIVISION

LOG OF OIL OR GAS WELL

Company Murphy Corporation Address Box 76, Poplar, Montana
Lessor or Tract East Poplar Unit Field East Poplar State Poplar MONTANA
Well No. 18 Sec. 2 T. 28N R. 51E Meridian Roosevelt County Roosevelt
Location 1990 ft. { N } of North Line and 1980 ft. { E } West Line of Sec. 2 Elevation 2102 gr.
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed Harold J. Smith

Title District Production Supt.

Address Box 76, Poplar, Montana

Date January 21, 1953

The summary on this page is for the condition of the well at above date.

Commenced drilling November 11, 1952 Finished drilling December 20, 1952

Oil or Gas Sands or Zones
(Denote gas by G)

Important Water Sands

No. 1, from A 5513 to 5523
No. 2, from B-1 5650 to 5658
No. 3, from B-2 5667 1/2 to 5677 1/2
No. 4, from C 5808 to 5818
No. 5, from _____ to _____

No. 1, from _____ to _____
No. 2, from _____ to _____
No. 3, from _____ to _____
No. 4, from _____ to _____
No. 5, from _____ to _____

RECEIVED

JAN 24 1953

OIL CONSERVATION BOARD AND BOARD
OF RAILROAD COMMISSIONERS
BILLINGS

CASING RECORD

Size	Weight per	Threads	Make	Amount	Kind of	Cut & Pulled	Perforated	Purpose
Casing	lb/ft	in/ft	in/ft	lb/ft	in/ft	in/ft	in/ft	in/ft
13 3/8	20	8	Nat'l	949.68	HOWCO			
9 5/8	36	8	Nat'l	5788.90	HOWCO			
5 1/2	15	8	Nat'l					
4 1/2	12	8	Nat'l					
3 1/2	10	8	Nat'l					
2 1/2	8	8	Nat'l					
2	6	8	Nat'l					
1 1/2	4	8	Nat'l					
1	3	8	Nat'l					
3/4	2	8	Nat'l					
1/2	1	8	Nat'l					

CASING OR TOOLS LOST OR SIDETRACKED

From _____ to _____
From _____ to _____

Well No. 7-13

22

C. H. Murphy et al
 Well Name Ben Zimmerman
 East Poplar Unit #18
 Structure Poplar Dome
 County Roosevelt
 State Montana
 Surface Elevation and Formation
 2113 KB 2102 Gr. Ben
 Landowner Fee Zimmerman
 East Poplar Unit

Twp. 28 N.

Rge. 51 E.

Sec. 2

Location

C SE NW

1980 S/N

1980 E/W

1-2-52 C zone flowed 104 B oil,
 15.4 BS 12/64" choke 3 hr test;
 Flowed 476 BO in 14 hrs, 12/64"
 (FCP)

Sands:

A5513-5523

B-1 5650-5658

B-2 5667½-5677½

C 5808-5818

Lessee

C.H. Murphy et al API # 25-085-05056

Drilling Company

C.H. Murphy et al

Representative in Charge

Harold Milam- Dist Prod Supt.

Contractor or Driller s: Massey, White,
 Morris.

Casing:

36' of 13-3/8" w/ 30 sx

949' of 9-5/8" w/ 400 sx.

5788' of 5½" w/ 250 sx.

Date Location 11-7-52 App 11-12-52 HHP
 Date Spudded 11-11-52

s/w 4, 4 & 2

11-14-52 BURT (FCP) 10G IN FILE

11-21-52 Drilling 3100 (FCP) ETC.

12-16-52 Coring 5181, 950' of

9-5/8" w/ 400 sx. Samp tops:

Muddy 2880, Heath 4825, Otter 5010,

Elev 2113 KB (FCP)

12-19-52 Comp 12-15-52, 5½" at 5789

w/ 250 sx; TD 5809; Sch Tops: Kibbey

5143; Charles 5397; A Zone 5513;

B1 zone 5650; B2 zone 5667½; Mission

Canyon 5800; C zone 5808; will perf.

(FCP)

Completed	Total Depth	Formation
12-15-52	5809	
Oil	Gas	Water
Flow 476 BOPD thru choke		
Final Result		

Put to producing 12-20-52

Casing		Mud		Cement		Pump & Plug		Shooting Record	
Size	Weight	Volume	Weight	Volume	Weight	Volume	Weight	Volume	Weight
13 3/8	36.80	8 yds	remix	Pump & Plug					
26 1/2	949.68	100 sacks		Pump & Plug					
21 1/2	5800.00	250 sacks		Pump & Plug					
21 1/2	2111-2800	250 sacks		Pump & Plug					
21 1/2	2221-2200	220 sacks		Pump & Plug					
21 1/2	2210-2130	210 sacks		Pump & Plug					
21 1/2	2130-2180	218 sacks		Pump & Plug					
21 1/2	2180-2230	223 sacks		Pump & Plug					
21 1/2	2230-2280	228 sacks		Pump & Plug					
21 1/2	2280-2330	233 sacks		Pump & Plug					
21 1/2	2330-2380	238 sacks		Pump & Plug					
21 1/2	2380-2430	243 sacks		Pump & Plug					
21 1/2	2430-2480	248 sacks		Pump & Plug					
21 1/2	2480-2530	253 sacks		Pump & Plug					
21 1/2	2530-2580	258 sacks		Pump & Plug					
21 1/2	2580-2630	263 sacks		Pump & Plug					
21 1/2	2630-2680	268 sacks		Pump & Plug					
21 1/2	2680-2730	273 sacks		Pump & Plug					
21 1/2	2730-2780	278 sacks		Pump & Plug					
21 1/2	2780-2830	283 sacks		Pump & Plug					
21 1/2	2830-2880	288 sacks		Pump & Plug					
21 1/2	2880-2930	293 sacks		Pump & Plug					
21 1/2	2930-2980	298 sacks		Pump & Plug					
21 1/2	2980-3030	303 sacks		Pump & Plug					
21 1/2	3030-3080	308 sacks		Pump & Plug					
21 1/2	3080-3130	313 sacks		Pump & Plug					
21 1/2	3130-3180	318 sacks		Pump & Plug					
21 1/2	3180-3230	323 sacks		Pump & Plug					
21 1/2	3230-3280	328 sacks		Pump & Plug					
21 1/2	3280-3330	333 sacks		Pump & Plug					
21 1/2	3330-3380	338 sacks		Pump & Plug					
21 1/2	3380-3430	343 sacks		Pump & Plug					
21 1/2	3430-3480	348 sacks		Pump & Plug					
21 1/2	3480-3530	353 sacks		Pump & Plug					
21 1/2	3530-3580	358 sacks		Pump & Plug					
21 1/2	3580-3630	363 sacks		Pump & Plug					
21 1/2	3630-3680	368 sacks		Pump & Plug					
21 1/2	3680-3730	373 sacks		Pump & Plug					
21 1/2	3730-3780	378 sacks		Pump & Plug					
21 1/2	3780-3830	383 sacks		Pump & Plug					
21 1/2	3830-3880	388 sacks		Pump & Plug					
21 1/2	3880-3930	393 sacks		Pump & Plug					
21 1/2	3930-3980	398 sacks		Pump & Plug					
21 1/2	3980-4030	403 sacks		Pump & Plug					
21 1/2	4030-4080	408 sacks		Pump & Plug					
21 1/2	4080-4130	413 sacks		Pump & Plug					
21									

Size of Shell	Quantity	Date	Depth Shot	Depth Cleaned Out
Jet	4 shots per ft.		5650-58	
Jet	4 shots per ft.	11-13	5667-75	
Jet	2 shots per ft.		5809-15	
Cemented with 30 sacks cement and 8 bags ls. - 10 ft. depth.				

TOOLS USED

Rotary tools were used from 0 5815 feet to 5815 feet, and from 5815 feet to 5815 feet.

Cable tools were used from 5815 feet to 5815 feet, and from 5815 feet to 5815 feet.

DATES

....., 19..... Put to producing December 20, 1952

The production for the first 24 hours was 521.10 barrels of fluid of which 98.0 % was oil; 2 % emulsion; % water; and % sediment.

If gas well, cu. ft. per 24 hours.....	Rock pressure, lbs. per sq. in.....	1602152
Gallons gasoline per 1,000 cu. ft. of gas.....		0 SOME IMPROVED SYSTEMS INTERIOR CHAMBERS
R. H. Massey Driller.	T. R. White Driller.	
C. B. Morris Driller.		

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "side-tracked" or left in the well, give size and location. If the well has been dynamited, give date, size, position, and number of shots. If plug or bridge were put in to test for water, state kind of material used, position, and results of pumping or bailing.

FORMATION RECORD		FORMATION
From	To	FORMATION
	Total Feet	FORMATION
	1300	1300
	1335	SCHLUMBERGER TOPS
	1500	1500
	1525	1525
	1585	1585
	2338	2338
	2538	2538
From	To	2602
		2902
		3117

ELECTRO LOG DATA

TYPE LOG

INTERVAL LOGGED

ES.....	150-5808
Detail.....	4600-5808
Microlog 5".....	2300-2420
	2890-2950
	4300-4400
Microlog 25".....	5340-5806

TENTATIVE TOPS

Eagle.....	1127	(/ 986)
Niobrara.....	1985	(/ 128)
Greenhorn.....	2338	(- 225)
Graneros.....	2538	(- 425)
U. Muddy.....	2682	(- 569)
Muddy Sd.....	2902	(- 789)
Dakota.....	3117	(-1004)
Morrison.....	3500	(-1387)
Swift.....	3570	(-1457)
Rierdon.....	3902	(-1789)
Piper Shale.....	4260	(-2147)
Piper Limestone.....	4332	(-2219)
Gypsum Springs.....	4390	(-2277)
Spearfish.....	4586	(-2473)
Amaden.....	4700	(-2587)
Heath.....	4833	(-2720)
Otter.....	5005	(-2892)
Kibbey Sand.....	5143	(-3030)
Kibbey Limestone.....	5304	(-3191)
Madison.....	5397	(-3284)
A Zone.....	5513	(-3400)
B-1.....	5650	(-3537)
B-2.....	5667 1/2	(-3554 1/2)
C Zone Intercrystalline Porosity.....	5808	(-3695)

ELECTRO LOG DATA

<u>TYPE OF LOG</u>	<u>INTERVAL LOGGED</u>
ES	150'-5808'
Detail	1600'-5808'
Microlog 5"	2300'-2420'
	2890'-2950'
	4300'-4400'
Microlog 25"	5310'-5806'

LOG TOPS

	<u>Depth</u>	<u>Datum</u>	<u>Thickness</u>
Eagle	1127	+ 986	
Michrara	1985	+ 128	
Greenhorn	2338	- 225	
Granston	2538	- 425	
U. Muddy	2682	- 569	
Muddy Sh.	2902	- 789	
Dakota	3117	-1304	
Morrison	3500	-1387	
Swift	3570	-1457	
Riardon	3902	-1789	
Piper Sh	4260	-2147	
Piper Ls.	4332	-2219	
Gypsum Sprgs	4390	-2277	
Spearfish	4586	-2473	
Arden	4700	-2587	
Heath	4833	-2720	
Otter	5005	-2892	
Kimbey Sh.	5143	-3030	
Kimbey Ls.	5304	-3191	
Madison	5397	-3284	
A-1	5478	-3365	4'
A-2	5489	-3376	3'
A-3	5500	-3387	13'
A-4	5525	-3412	25'
B-1	5650	-3537	8'
B-2	5668	-3555	16'
B-3	5688	-3575	6'
B-4	5719	-3606	?
B-5	5756	-3643	?
C-1	5798	-3685	?
C-2			

CORE DESCRIPTIONSCore No. 1

4896-4923

Rec. 23 $\frac{1}{2}$ '

C. T. 14, 23, 28, 32, 25/ 58, 24, 59, 28, 21/ 22, 12, 21, 25, 27/ 28, 20, 18, 19, 22/ 16, 15, 18, 30, 35/ 75, 85.

- 5' Shale, reddish-brown, silty, micaceous, slightly calcareous, becomes dense toward base. 4901
- 1'6" Siltstone, grayish-white, poor sorting, slightly calcareous. } 4903
- 6" Shale, light grayish-green, with reddish brown splotches. }
- 1' Shale, reddish-brown, silty, micaceous, slightly calcareous. 4904
- 15'6" Sand, reddish-brown, fine grained, sub-rounded to angular, poor sorting, fairly well cemented, argillaceous, micaceous; poor porosity at top, increasing toward base; occasional prominent vertical fractures with no stain, anhydritic cement near base of unit; several 1" partings of reddish-brown shale in middle of section. 4904
4923

Core No. 2

4923-4939

Rec. 18'

C. T. 20, 19, 18, 18, 22/ 24, 19, 15, 19, 15/ 25, 28, 38, 38, 22/ 30.

- 7' Sandstone, reddish-brown, fine to very fine grained, sub-rounded to angular, well cemented, slightly calcareous, argillaceous and anhydritic; poorly sorted, few mottles of gray sandstone, very hard and tight; occasional short, thin, tight, vertical fractures. No Show.
- 5' Sandstone, reddish-brown and light gray, fine-to-very fine grained, poorly sorted, angular, well cemented; occasional large fragments of red shale; slightly anhydritic, very hard and dense. No Show.
- 1' Sandstone, light gray-purple, very fine grained, poorly sorted, angular, well cemented, numerous large fragments of red and gray and green shale; bedding very distorted with some bedding planes making an angle of 45° with horizontal. No Show.
- 3' Sandstone, purple, fine to medium grained, angular, poorly sorted, well cemented, fairly porous and slightly permeable, single well developed, open, vertical fracture running length of unit, with white gypsum along fracture plane. No Show.

(Core No. 2 continued)

- 6" Shale, very light reddish-gray, slightly glauconitic, very slightly silty, waxy lustre; occasional fairly large, reddish-brown iron stain. No Show.
- 1'6" Sandstone, reddish-brown, very fine to fine grained, angular, sub-rounded, milky to clear grains, poorly sorted, fairly well cemented with argillaceous cement, fairly porous, slightly permeable, very slightly calcareous, slightly anhydritic. No Show.
- - - - -

Core No. 3

5140-70

Rec. 27'

- C. T. 35, 40, 30, 33, 37/ 33, 30, 32, 25, 24/ 26, 32, 22, 24, 25/ 26, 16, 17, 34, 25/ 25, 21, 23, 30, 20/ 20, 19, 22, 19, 30/
- 2'6" Limestone, dark gray, micro-to-fine crystalline, very hard and dense, single tight vertical fracture filled with calcite running length of unit. No Show.
- 1'6" Dolomite, light gray, microcrystalline, dense, single tight, vertical fracture filled with calcite running length of unit. No Show.
- 1' Shale, medium gray, with thin streaks of dark red and green, waxy luster, very calcareous. No Show.
- 1' Limestone and dolomite, medium gray, amorphous to microcrystalline, very hard and dense; occasional large reddish-brown iron stain. No Show.
- 1' Anhydrite and dolomite; anhydrite, light gray, medium crystalline, medium soft, fragmental; dolomite, medium gray, microcrystalline, very hard, dense, forms matrix around anhydrite fragments.
- 1' Anhydrite, light gray to white, medium crystalline, fairly soft. No Show.
- 2' Dolomite, light gray, microcrystalline to fine crystalline, very hard, dense, numerous fairly large inclusions of light gray anhydrite; few short, tight, vertical fractures; occasional large spots of red dolomite. No Show.
- 2' Dolomite, medium gray, micro-to-fine crystalline, very hard, dense, few short, very tight, vertical fractures filled with selenite. No Show.
- 5' Dolomite, dark reddish-brown, microcrystalline, dense, breaks with a ragged fracture, numerous short, tight vertical fractures. No Show.

(Core No. 3 continued)

- 5' Limestone, light reddish-brown, fine-to-medium crystalline, medium hard, dense, occasional fairly long, tight, vertical fracture filled with selenite crystals. No Show.
- 1'6" Shale, brownish-gray, medium hard, waxy luster, very calcareous, with numerous streaks of light gray crystalline limestone.
- 6" Dolomite, very light gray, earthy, amorphous to microcrystalline, very hard, dense; occasional short, very tight vertical fracture filled with selenite. No Show.
- 3' Dolomite, reddish-brown, microcrystalline, with streaks of gray, medium crystalline, hard, dense; occasional short, tight, vertical fracture filled with selenite; numerous small inclusions of white anhydrite. No Show.
- - - - -

Core No. 4

5170-5189

Rec. 18'

- C. T. 40, 53, 48, 28, 43/ 43, 45, 43, 32, 35/ 38, 38, 45, 29, 48/ 35, 25, 17, 29,
- 2' Anhydrite, white to gray, fine-to-medium crystalline, single tight, vertical fracture. No Show.
- 1'6" Anhydrite, light gray, fine crystalline, very sandy; sand composed of medium rounded, very fine grained 1" gray shale parting in middle of section. No Show.
- 1' Dolomite, medium to dark gray, fine crystalline, tight, No Show.
- 1' Sand, light gray-purple, very fine grained, sub-rounded, medium sorting, medium cemented with anhydrite, slight porosity. No Show.
- 3'6" Sand, red-purple, very fine grained, medium to sub-rounded, medium cemented, fairly well sorted, grains clear to milky color due to anhydritic cement, fair to medium porosity. No Show.
- 3' Dolomite, red-brown, microcrystalline, dense, several very thin, gray shale partings; one short, tight, vertical fracture in middle of section. No Show.
- 6' Sand, dark purplish-red, very fine grained to fine grained, fairly well sorted, angular to sub-rounded, fairly well cemented, good permeability, looks wet. No Show.
- - - - -

Core No. 5

5531-56

Rec. 21'

"A" Zone

C. T. 40, 40, 30, 30, 30/ 30, 30, 30, 30, 30/ 30, 40, 28, 28, 20/ 18, 25, 22, 30, 20/ 30, 25, 27, 17, 17/ 15,

3'6" Limestone, dark gray to black, fine-to-medium crystalline, good permeability, numerous short, irregular fractures, oil bleeding from fractures, golden-yellow fluorescence along fractures, numerous calcite crystals and veinlets.

6" Limestone, dark grayish-brown, fine crystalline, medium hard, slight permeability, slight oil odor.

3' Limestone, dark gray, fine-to-medium crystalline, numerous irregular, short, tight fractures, oil bleeding from fractures, golden-yellow fluorescence along fractures and in mass, good porosity.

7' Limestone, dark grayish-brown to black, fine-to-medium crystalline, granular, good permeability and porosity, slight oil odor, scattered specks of light yellow fluorescence.

6'6" Anhydrite and limestone; anhydrite, grayish-white, fine crystalline, tight; limestone, dark grayish-brown, medium to coarse crystalline, porous.

6" Dolomite, medium brown, micro-to-fine crystalline, tight, numerous tight calcite veinlets, strong sulphur odor on fresh break.

- - - - -

Core No. 6

5646-5679

Rec. 33'

C. T. 18, 18, 27, 21/ 25, 25, 24, 26, 19/ 26, 14, 37, 20, 18/ 14, 20, 19, 20, 20/ 25, 20, 20, 25, 26/ 25, 27, 15, 21, 26/ 28, 32, 30, 35/

6' Anhydrite, dark gray to white, fine-to-medium crystalline, dolomitic, rectangular network of approximately 2" medium tight fractures throughout unit, fracture cemented with dolomite. No Show.

8' Limestone, medium brown-gray, fine-to-medium crystalline, numerous accicular and platy brown-black calcite crystals in top 3' and bottom 3'; good permeability, good oil odor; oil bleeding from fresh break, excessive bleeding in 1' section 3' from top; numerous short, irregular, medium fractures, one vertical fracture 1' in length at base of unit; good even golden-yellow fluorescence along fracture planes and spotted fluorescence on mass of core; entire unit appears saturated.

10' Anhydrite and dolomitic limestone; dark gray-to-very light gray-white, fine-to-medium crystalline, dense; short, tight, interconnected fracture. No Show.

(Core No. 6)

- 9' Limestone, dark brown-gray, fine-to-medium crystalline, good permeability throughout unit, good intercrystalline porosity at top of unit, decreasing to pinpoint porosity at base; numerous resinous calcite crystals in lower 7'; numerous irregular fractures bleeding oil, occasional stylolites, entire unit appears saturated with excessive bleeding in top 1' of unit; good golden-yellow fluorescence in top 1', medium golden-yellow fluorescence in splotches on mass of core and even on fracture planes; a very slight taste of salt in upper portion, increasing toward base of section.

NOTE: Interconnected network of fractures in anhydrite sections are irregular network of dolomitic shale partings.

- - - - -

Core No. 7

5774-5809

Rec. 35'

- C. T. 30/ 47, 30, 28, 55, 53/ 40, 37, 35, 50, 25/ 34, 34, 35, 33, 40/ 45, 40, 35, 45, 32/ 28, 40, 45, 30, 25/ 35, 60, 42, 33, 31/ 33, 30, 22, 25.
- 2' Shale, dark gray to black, dense, medium hard, calcareous; one prominent vertical fracture. No Show.
- 6" Limestone, dark brown-gray, very fine crystalline, dense, dolomitic.
- 1'6" Anhydrite, dark gray to black, hard, dense. No Show.
- 6" Shale, black, dense, hard, calcareous.
- 3'6" Interbedded limestone and dolomite; dolomite, dark brown-black, hard, dense; limestone, very fine crystalline, gray-white, hard and dense. N/S.
- 5" Interbedded dolomite and anhydrite; dolomite, dark brown-black, amorphous to very fine crystalline, hard and dense; anhydrite, gray-white, fine crystalline, medium hard. No Show.
- 7' Limestone, dark gray-black, fine to medium crystalline, slight permeability, anhydritic, highly broken in top 4' and one prominent vertical fracture in bottom 3'. No Show.
- 5' Dolomite, dark gray black, amorphous, dense, gray-white anhydrite inclusions, several short, irregular fractures, and black shale partings at top and base.
- 6" Shale, black, hard, dense, calcareous.
- 1'6" Dolomite, dark brown-gray, amorphous to fine crystalline, hard, tight and dense. No Show.

(Core No. 7 continued)

- 2' Limestone, medium brown-gray, fine-to-medium crystalline, fair permeability, numerous short, irregular, recemented fractures, numerous calcite inclusions. No Show.
- 4' Limestone, dark gray-black, fine crystalline, hard, little to no permeability, slight sulphurous odor; several black shale partings, some weak yellow fluorescence; slight salt taste.
- 2' Limestone, dark gray-to-black, fine to medium crystalline, fair permeability, some weak yellow fluorescence in mass; slightly salty.

D R I L L S T E M T E S T S

DST #1, with Halliburton Tool, 5800 to 5810', 5/8" bottom choke. No water cushion; tool open at 4:45 A.M. for 85 minutes. Open with weak bubbles for 5 minutes. Re-set tool 5 times, getting few bubbles each reset. Recovered 70' clean mud.
IBHFP: 10# FBHFP: 42# No Shut-in.
Hydro: 2995# Dry Test.

C O R E A N A L Y S I S R E S U L T S

Company MURPHY CORPORATION Formation Heath Page 1 of 1
 Well East Poplar Unit No. 18 Cores Diamond File FL 25-305
 Field East Poplar Drilling Fluid Water Base Mud Date Report 12-3-52
 County Roosevelt State Montana Elevation 2113' KB Analysts RWH
 Location C SE NW Sec. 2-28N-51E Remarks Permeability and Porosity Only.

C O R E A N A L Y S I S R E S U L T S

Sample Number	Depth Feet	Permeability Millidarcys	Porosity Per Cent	Residual Saturation		Remarks
				Oil	Water	
1	4907.5	0.1	2.1			Shaley sand.
2	4912.5	0.0	1.7			Shaley sand.
3	4917.5	0.0	1.3			Shaley sand.
4	4924.5	0.0	1.1			Shaley sand.
5	4933.5	0.0	2.3			Shaley sand.
6	4935.5	0.0	1.2			Shaley sand.
7	4937.5	0.6	5.5			Sand, sugary texture.

Company MURPHY CORPORATION Date On Dec. 2, 1952 File No. FL 25-305(S)
 Well East Poplar Unit No. 18 Date Off Dec. 12, 1952 Engrs. WEM, REW
 Field East Poplar Formation Madison Elevation 2113⁸ KB
 County Roosevelt State Mont. Drlg. Fld. Water Base Mud Cores Diamond
 Location C SE NW Sec. 2, Twp. 28N-51E Remarks Service No. 9

CORE ANALYSIS RESULTS

Sample Number	Depth Feet	Permeability Milidarcys Max. 90°		Porosity Per Cent	Residual Saturation		Description
					% Pore Space		
					Oil	Water	
1	5531.0-32.4	0.2	0.2	4.2	4.8	38.1	SVF
2	32.4-33.7	0.6	0.3	4.3	9.3	32.6	SVF
3	33.7-35.0	0.2	0.1	4.9	6.1	34.7	SVF
4	35.0-36.3	0.9	<0.1	4.6	6.5	28.2	VF
5	36.3-37.9	2.4	0.4	8.1	3.7	42.0	VF
6	37.9-39.3	0.9	0.1	5.9	6.8	37.3	VF
7	39.3-40.9	0.9	0.7	10.7	3.7	58.0	VF
8	40.9-42.0	2.3	1.7	10.0	3.0	53.0	
9	42.0-43.2	2.8	2.4	16.6	1.2	59.6	SVF
10	43.2-44.6	5.5	3.5	16.8	2.4	65.5	
11	44.6-45.7	5.6	1.0	12.7	3.2	55.2	
12	45.7-46.4	<0.1	<0.1	1.5	0.0	26.6	
13	5651.0-52.1	<0.1	<0.1	1.8	0.0	55.6	
14	52.1-53.3	1.5	1.1	14.7	13.6	36.0	SVF
15	53.3-54.6	0.7	0.4	13.0	13.8	28.5	SVF
16	54.6-55.9	2.4	0.6	7.5	10.7	33.3	SVF
17	55.9-57.1	1.2	0.5	8.9	11.2	42.7	SVF
18	57.1-58.7	0.5	<0.1	10.0	9.0	49.0	SVF
19	58.7-59.9	0.3	0.2	9.2	8.7	37.0	SVF
20	5670.0-71.3	0.6	0.3	5.6	8.9	50.0	SVF
21	71.3-72.8	0.5	<0.1	6.3	9.5	55.6	SVF
22	72.8-73.9	0.3	0.2	6.0	11.7	45.0	
23	73.9-74.9	2.6	1.6	8.4	13.1	41.7	
24	74.9-75.8	3.6	1.4	10.2	13.7	43.1	
25	75.8-76.9	1.7	0.9	13.3	17.3	72.8	
26	76.9-78.0	1.0	0.6	11.8	11.0	45.8	SVF
27	78.0-78.9	0.8	0.2	12.3	10.6	41.5	SVF
28	5799.0-00.0	<0.1	<0.1	2.1	14.3	38.1	VF
29	5800.0-01.5	0.0	*0.0	4.9	8.2	53.1	VF
30	01.5-03.0	0.0	*0.0	1.1	18.2	45.5	VF
31	03.0-04.5	0.0	*0.0	2.7	7.4	44.4	VF
32	04.5-06.0	0.0	*0.0	4.7	8.5	55.3	VF
33	06.0-07.5	0.0	*0.0	3.2	9.4	43.7	VF
34	07.5-09.0	0.0	*0.0	3.8	7.9	26.3	VF

C O M P L E T I O N D A T A

Drilled plug, with bit on tubing, from 5 $\frac{1}{2}$ " and made one foot of hole (4 3/4") to 5910. Ran Drill Stem Test No. 1 to test open hole from 5800 to 5810(dry test). Drilled from 5810 to 5815'.

Shot 5809-5815 with open hole jet shots; perforated B-2 Zone, 5667-5675, with 4 jet shots per foot; perforated B-1 Zone, 5650-5658, with 4 jet shots per foot.

Ran wire line junk basket to clean junk out of hole. Set Baker Model "D" Packer on wire line at 5778'. Ran 184 joints 2 3/8 inch 8 thread tubing, 3 Subs and Otis choke. Total 5768.70 feet.

Landed 9.30 feet below RB spaced as follows:

Top joint.....	31.53'
#1 Sub.....	6.08'
#1 Sub.....	2.08'
#1 Sub.....	10.12'
183 joints tubing.....	5716.98'
1 Otis choke.....	1.33'
1 Baker Findersub.....	.58'
Landed below R.K.B.....	9.30'
Top Baker Model "D" Packer.....	5778.00'
2 Baker Seal Nipples.....	2.05'
1 Baker Flush Jt.....	12.92'
1 Baker Perf. Int.....	1.83'
1 Baker Seal Nipple.....	.85'
1 Flush Jt. Plug.....	5.12'
Bottom of Tubing.....	5800.07'

Displaced mud with water. B-Zone would flow approximately 5 barrels of oil per hour; C Zone: 0. Acidized C-Zone with 1000 gallons. Opened well to pits. Flowed acid and fresh water for 15 minutes, then turned to oil. Shut well in to install choke.

Tubing SIP: 900#

Tubing FP: 800#

(1/4" choke)

Tubing FP: 900#

(1/8" choke)

Tubing SIP: 1000# (after flowing 1 hour)

Closed in C-Zone to acidize B-Zone.

Acidized B-Zone with 500 gallons of 15 per cent LT acid. Cleaned into pits; then turned both zones into tank.

SUMMARY OF COMPLETION DATA

CASING: 5789' of 5 $\frac{1}{2}$ " , set at 5800'
with 250 sacks cement.

TUBING: 2 3/8" tubing set on packer
at 5778' with tail pipe to
5800.07. Otis choke included
in string.

PACKERS: Baker Model "D" Packer set at
5778'.

PERFORATIONS: 5650-58 (B-1) with 4 jet SPF.
5667-75 (B-2) with 4 jet SPF.
5809-15 (C) with o.h. jet shots.

All perforations made according
to SCHLUMBERGER Microlog measure-
ments.

ACID: 1000 Gallons in the C-Zone.
500 Gallons in the B-Zone.

TYPE COMPLETION: Dual; B-Zone through annulus.
C-Zone through tubing.

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P R O D U C T I O N T E S T D A T A

EAST POPLAR UNIT #18

<u>TIME</u>	<u>CHOKE</u>	<u>FLUID</u>	<u>BS&W</u>	<u>OIL</u>	<u>PRESSURE</u>
(14 hour Test on Tubing and Casing, Dec. 20 to 21, 1952.)					
5:20 PM to 7:20 AM	Csg. 12/64" Tbg. 6/64"	489.99	2.8% 2.8	476.27	Csg. 600# Tbg. 1100#
(6 hour Test on Tubing, Dec. 21, 1952.)					
8:00 AM to 11:00 AM	12/64"	123.05	15.4	104.10	Csg. 800# Tbg. 975#
11:15 AM to 2:15 PM	10/64"	57.74	4.0	55.43	Csg. 800# Tbg. 975#
(14 hour Test on Casing, Dec. 22, 1952.)					
5:10 PM to 7:10 AM	10/64"	275.22	.8%	275.22	Csg. 750# Tbg. 1050#
(6 hour Test on Casing, Dec. 30, 1952.)					
1:00 PM to 7:00 PM	12/64"	187.41	.8M. 1.4P.	183.29	Csg. 700# Tbg. 1100#
(3 hour Test on Casing, Dec. 30, 1952.)					
7:20 PM to 10:20 PM	10/64"	59.24	1.8P	58.17	Csg. 700# Tbg. 1100#
(12 hour Test on Casing, Dec. 30, 1952.)					
10:45 PM to 10:45 AM	8/64"	165.67	1.2P	163.68	Csg. 700# Tbg. 1100#

=====

SAMPLE DESCRIPTION

- 2500-2540 Shale, medium gray, silty, calcareous.
- 2540 Sample Top Graneros.
- 2540-2620 Shale, dark gray, slightly micaceous, some pyrite.
- 2620-2850 Shale, dark gray; shale, light gray, silty, calcareous, trace of bentonite.
- 2850-2880 Shale, dark gray; shale, light gray, silty, calcareous, trace of bentonite; some siltstone; medium, calcareous.
- 2880 Sample Top Muddy.
- 2880-3120- Shale, dark gray; shale, light gray, silty, calcareous, trace of bentonite; sandstone, gray-white, fine grained, well cemented, medium sorting, glauconitic; some bentonite; trace of pyrite.
- 3120 Sample Top Dakota Silt.
- 3120-3170 Shale, dark gray, calcareous; siltstone; grayish-brown, slightly calcareous; some sandstone.
- 3170-3250 Same as above plus sandstone; white, medium cemented, well sorted, sub-rounded.
- 3250-3390 Sand, light gray, fine grained, medium sorting, some bentonite; trace of gray shale and glauconitic silt.
- 3390-3490 Sand, light gray, fine grained, medium sorting, glauconitic, speckled; trace of gray shale and silt.
- 3490 Sample Top Morrison.
- 3490-3510 Shale, dark gray, medium hard; shale, light gray, soft.
- 3510-3570 Sand, light gray, fine grained, medium cemented, glauconitic; some gray, silty, calcareous shale.
- 3570-3650 Sand, light gray, fine grained, fairly well cemented, sub-angular, glauconitic; some black and gray, slightly calcareous shale; trace of light gray silt.
- 3650-3690 Sand, light gray, fine grained, medium cemented, sub-angular, glauconitic, calcareous; some black and gray shale; some brown fine crystalline limestone.
- 3690-3730 Sand, light gray, fine grained, medium cemented, glauconitic; some black and gray shale.
-

- 3730-3770 Shale, black and gray, slightly calcareous; trace of light gray silt.
- 3770-3800 Shale, black and gray, slightly calcareous; trace of light gray silt; trace of light brown, fine crystalline limestone.
- 3800-3880 Shale, black and gray, calcareous; trace of light gray silt.
- 3880 Sample Top Ellis.
- 3880-4010 Sand, fine grained, medium cemented, sub-angular, calcareous, glauconitic; some light gray, silty, calcareous, micaceous shale.
- 4010-4050 Shale, light gray, micaceous, calcareous; some dark gray shale; trace of gray silt.
- 4050-4070 Same as above and trace of gray-white, very fine grained sand.
- 4070 Sample Top Rierdon.
- 4070-4130 Shale, light gray, micaceous, calcareous; some brown, fine crystalline limestone; trace of brown, very fine grained, sub-angular sandstone.
- 4130-4230 Shale, light gray, micaceous, calcareous; some dark gray shale; trace of gray silt.
- 4230 Sample Top Piper Shale.
- 4230-4300 Red shale; trace of light gray, fine grained sandstone; some light gray, calcareous shale.
- 4300-4310 Shale; light gray, calcareous, micaceous.
- 4310 Sample Top Piper Limestone.
- 4310-4390 Limestone, brown, fine crystalline; some green calcareous shale, some gray calcareous shale.
- 4390 Sample Top Gypsum Springs.
- 4390-4500 Sandstone, gray, fine grained, glauconitic, calcareous; some red and green calcareous shale, some gray calcareous shale.
- 4500-4585 Same as above plus traces of bentonite and pyrite.
- 4585 Sample Top Spearfish.
- 4585-4710 Sandstone, red, sub-rounded, very fine grained, calcareous; traces of gray, red and green calcareous shale; trace of light brown and pink dense limestone.
- 4710 Sample Top Amsden.
-

- 4710-4730 Limestone, light brown, fine crystalline; trace of gray white, fine crystalline dolomite; some red, green and gray calcareous shale.
- 4730-4825 Limestone, light brown to pink, fine crystalline, some red, gray and green calcareous shale; trace of purple shale.
- 4825 Sample Top Heath.
- 4825-4896 Shale, green, waxy, calcareous, some red and gray, calcareous shale, trace of purple calcareous shale.
- 4896 S.L.M. -- no correction.
- 4896-4923 Core No. 1.
- 4923-4939 Core No. 2.
- 4939-5005 Sandstone, red-brown, sub-rounded, fairly well sorted, medium cemented, slightly calcareous; mottled red, gray and purple calcareous shale; some gray, fine crystalline limestone; trace of gray, fine crystalline anhydrite.
- 5005 Sample Top Otter.
- 5005-5070 Limestone, gray-white, fine crystalline; some green calcareous shale; some reddish-brown, fine grained, slightly calcareous sandstone.
- 5070-5140 Limestone, light brownish-gray, fine crystalline, some red, calcareous shale; some green shale with ankerites; some purple calcareous shale; trace of reddish-brown, fine grained, calcareous sandstone.
- 5140-5170 Core No. 3.
- 5170-5189 Core No. 4.
- 5189-5260 Sand, red, fine grained, sub-rounded, well cemented, calcareous; Dolomite, red-brown, fine crystalline; red fine crystalline limestone; some red shale, some green shale with ankerites; trace of purple shale.
- 5260-5280 Limestone, fine crystalline; some red, fine grained, calcareous sandstone; trace of red and gray calcareous shale.
- 5280 Sample Top Kibbey Limestone.
- 5280-5300 Limestone, light brown, fine crystalline, calcite inclusions; some red, fine grained, calcareous sandstone; trace of red, gray and green calcareous shale.
- 5300-5360 Same as above plus some red, fine crystalline dolomite.
- 5360-5390 Limestone, gray brown, fine crystalline; red, fine grained, calcareous sandstone; some red, sandy shale; some gray calcareous shale.
-

5390 Sample Top Charles.

5390-5440 Anhydrite, grayish-white, fine crystalline; some red, fine grained anhydritic sandstone; trace of gray fine crystalline limestone; some gray, calcareous shale.

5440-5500 Anhydrite, grayish-white, fine crystalline; gray fine crystalline dolomite; some gray, and black fine crystalline limestone; some red calcareous shale.

5500-5531 No Samples.

5531-56 Core No. 5.

5556-5590 Anhydrite; gray, very fine crystalline; limestone, dark gray, fine crystalline; some red and gray calcareous shale.

5590-5640 Same as above and trace of gray, fine crystalline dolomite.

5646-5679 Core No. 6.

5679-5770 Anhydrite, gray, fine crystalline; limestone, dark gray to black, fine crystalline; some red and gray calcareous shale.

5774-5809 Core No. 7.

Total Depth: Driller 5809' = Schlumberger 5809'.

Drilled through plug to 5815'.

SERVICE & TESTING

EAST POPLAR UNIT NO. 18

REDA PUMP INSTALLATION

7-13-73 200 H.P. Reda pump ran 7-12 and 7-13-73
Started pump at 11:59 A.M. 7-13-73.

7-29-73 Pump went down at 2:00 P.M. - Unable to start.

7-30-73 Motors burnt out - faulty motors - nothing to do with well conditions
or operation.

8-4-73 Ran new pump - Well down from 7-29-73 till 8-4-73.

8-14-73 Pump running fine. Amperage dropped from 46 on start up to 40 within
36 hours and steady. Put 150 to 200 PSI back pressure on pump 8-10-73.
No increase in amperage.

8-20-73 Pump running fine. 40 Amps with 190-200 PSI back pressure.

10-2-73 Pump running fine - End of trial period - Bought pump.

11/19/73 Motor burnt out

12/3/73 - Ran new pump - put well to pump.

2/4/73 Motor gyped up twisted shaft

2/19/73 Ran smaller pump

4/19/73 Started dumping acid in well from down
in to clear up any gyp that might
have formed while not injecting chemical.

4/23/74 Started injecting new form of chemical
down well to prevent the forming
of gyp (Scale)

Note:

The C-zone was blanked off approx
2-13-54 ~~8-5-58~~ while producing 63 BOD and
367 BWD - producing from B-1-2
currently

Test 1-56 Flowing 68.2 BFD (13L BO 546 BWD 80% W.C.)
on $1\frac{3}{4}$ @ 375 T.P.

Test 11-55 Flowing 457 BFD (175 BO 379 BWD 61% W.C.)
on $1\frac{1}{4}$ @ 625 T.P.

EAST POPLAR UNIT NO. 18

WORKOVER HISTORY NO. 1

Lease and Well Number: East Poplar Unit No. 18

Field: East Poplar County: Roosevelt State: Montana

Well Location: C SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 2, T28N, R51E

STATUS PRIOR TO PRESENT JOB:

Date Completed: December 20, 1952

Producing Zone: Temporarily Abandoned Perforations: 5650'-58' B-1
5667'-75' B-2 and 5809'-15' C

T.D.: 5809' Cumulative Production: C-3 31,167 BO 46,885 BW
B-1 & 2 699,590 BO 5,595,977 BW

JUSTIFICATION FOR WORKOVER:

EPU No. 18 is temporarily abandoned, the last test showed 3 BOPD, 535 BWPD 99 $\frac{1}{2}$ % water. It is proposed to set a CIBP at 5600', perforate the A-4 Zone @ 5525'-33', swab test and if necessary, acidize with 250 gallons mud acid.

SUMMARY OF WORKOVER:

- 1-25-90 MIRUPU P.O.H. with rods and tubing. Rig up Halliburton Logging Service run in hole with gauge ring and junk basket to 5600'. P.O.H. pick up CIBP and set at 5600'. P.O.H. pick up 4" casing gun and perforate A-4 Zone 5525'-5533' 4 shots per foot. Pick up model R Packer and start in hole with tubing. SDFD.
- 1-26-90 Hydrotest tubing in the hole. Set Packer at 5519' with tail pipe at 5580' swab down to Seat Nipple. SDFD.
- 1-27-90 Tubing pressure 0 fluid level at 1000'. 1st run 50% oil. Swab to S.N. last run 3% oil. Shut down 1 hour make run with swab 3.46 BBLS per hour 30% oil. Fill tubing, release PKR. P.O.H. lay down PKR, pick up 5 $\frac{1}{2}$ " anchor. T.I.H. with tbg and pick up 1 $\frac{1}{2}$ " pump. T.I.H. with rods and start well pumping.
- 1-28-90 186 BWPD 2 BOPD
- 1-29-90 210 BWPD trace oil
- 1-30-90 Rig down rig and move off location.
- 2-06-90 238 BWPD trace oil

**CORE ANALYSIS REPORT
FOR
MURPHY CORPORATION**

**EAST POPLAR UNIT NO. 18 WELL
EAST POPLAR FIELD
ROOSEVELT COUNTY, MONTANA**



CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

February 17, 1953

Murphy Corporation
1125 University Building
Denver, Colorado

Attention: Mr. Gordon Kirby

Subject: Special Core Analysis
East Poplar Unit No. 18 Well
East Poplar Field
Roosevelt County, Montana

Gentlemen:

Diamond conventional cores from the subject well in the Madison formation have been sampled and quick-frozen by a representative of Core Laboratories, Inc., and later analyzed in our laboratory in Williston, North Dakota. Results of the analysis are presented in tabular and graphical form on the attached Special Analysis Core Report. Water base mud was used as the drilling fluid.

Formation analyzed from 5531 to 5546 feet has a very low residual oil saturation for this zone, and it is believed that on production it will show a high percentage of water.

Formation analyzed from 5651 to 5679 feet and from 5799 to 5809 feet is considered to be essentially oil productive where permeable. The latter zone has no measurable matrix permeability, but the vertical fracture system should increase the effective permeability.

Recovery estimates for the zone, 5652 to 5679 feet, are given on page one.

We hope these data prove beneficial in the evaluation of this well.

Very truly yours,

Core Laboratories, Inc.

J. D. Harris (pg)
J. D. Harris,
District Engineer

JDH:ma

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS

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 File FL 25-305 S
 Well East Poplar Unit No. 18

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

CORE SUMMARY

FORMATION NAME	Madison			
DEPTH, FEET	5652.1-5678.9			
% CORE RECOVERY	100			
FEET OF PERMEABLE, PRODUCTIVE FORMATION RECOVERED	17.8			
AVERAGE PERMEABILITY MILLIDARCS	Max.: 1.3 90°: 0.6			
CAPACITY — AVERAGE PERMEABILITY X FEET PRODUCTIVE FORMATION	Max.: 23 90°: 11			
AVERAGE POROSITY, PERCENT	9.8			
AVERAGE RESIDUAL OIL SATURATION, % PORE SPACE	11.6			
GRAVITY OF OIL, °A.P.I.	39			
AVERAGE TOTAL WATER SATURATION, % PORE SPACE	44.4			
AVERAGE CALCULATED CONNATE WATER SATURATION, % PORE SPACE	44.4			
SOLUTION GAS-OIL RATIO, CUBIC FEET PER BARREL (1)	660			
FORMATION VOLUME FACTOR—VOLUME THAT ONE BARREL OF STOCK TANK OIL OCCUPIES IN RESERVOIR (1)	1.38			

CALCULATED RECOVERABLE OIL

{ Production dependent upon complete isolation of each division. Structural position of well, total permeable thickness of oil zone and drainage area of well should be considered.

BY NATURAL OR GAS EXPANSION, BBLS. PER ACRE FOOT (2)	72			
INCREASE DUE TO WATER DRIVE, BBLS. PER ACRE FOOT	146			
TOTAL AFTER COMPLETE WATER DRIVE, BBLS. PER ACRE FOOT (3)	218			

Core Laboratories, Inc.

J. D. Harris (PE)
 J. D. Harris

NOTE:

- (*) REFER TO ATTACHED LETTER.
- (1) REDUCTION IN PRESSURE FROM estimated SATURATION PRESSURE TO ATMOSPHERIC PRESSURE.
- (2) AFTER REDUCTION FROM ORIGINAL RESERVOIR PRESSURE TO ZERO POUNDS PER SQUARE INCH.
- (3) RESERVOIR PRESSURE MAINTAINED BY WATER DRIVE AT OR ABOVE estimated ORIGINAL SATURATION PRESSURE.
- (4) NO ESTIMATE FOR GAS PHASE RESERVOIRS.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representation, as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

East Poplar Unit #18

Location: C SE NW Sec. 2-T28N-R51E

Spacing = 160 acres

Elevation: 2113 K.B.

Spudded: 11-11-52

Completed: 12-20-52

T.D.: 5809' drlr = 5809' Schl. Drld to 5815'

Prod. Zones: B-1 (5650-58) B-2 (5667-75')

C-2 Open Hole (5809-5815')

Schlumberger Tops

	Depth	Datum	Thickness
Judith River			
Greenhorn	2338	- 225	
Muddy Sd	2903	- 790	
Dakota Silt	3117	-1004	
Piper Ls	4332	-2219	
Amsden	4700	-2567	
Heath	4833	-2720	
Otter	5005	-2892	
Kibbey Sd.	5148	-3025	
Kibbey Ls	5304	-3191	
Madison	5397	-3284	
A-1	**5478	-3365	4'
A-2	**5489	-3376	3'
A-3	**5500	-3387	13'
A-4	*5525	-3412	25'
B-1	*5650	-3537	8'
B-2	*5668	-3555	16'
B-3	**5688	-3575	6'
B-4	**5719	-3606	?
B-5	5756	-3643	?
C-1	**5798	-3685	?
C-2	-----	-----	---

**Probable prod. Zones (From DST structural position, etc.)

*Shows

Drill Pipe Corrections (Made)

4475' Driller = 4475' SLM (0')

Coring Intervals:

#1 4896-4923 Rec. 23½' Heath
 #2 4923-4939 Rec. 18' Heath
 #3 5140-5170 Rec. 27' Kibbey Sd.
 #4 5170-5189 Rec. 18' Kibbey Sd.
 #5 5531-5556 Rec. 21' A-4
 #6 5646-5679 Rec. 33' B-1 & 2
 #7 5774-5809 Rec. 35' C-1

Drill Stem Tests:

DST #1 5800-5810 C-1, Op 85 min. Rec. 70' cln mud. IBHFP 10 FBHFP 42, No shut in, Hydro 2995, Dry test.

History Subsequent to Completion:

2-13-56: Blanked off C zone with Otis Separation Tool

PRODUCTION &
INJECTION DATA



